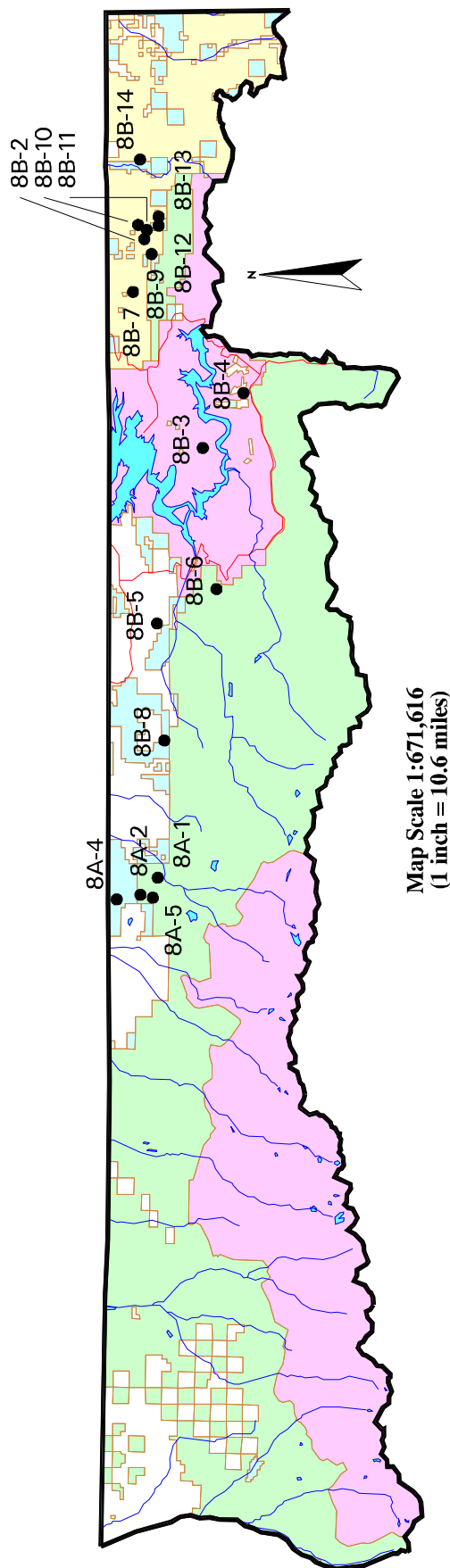


# Management Units 8A & 8B



## WILDLIFE MANAGEMENT UNIT 8B - NORTH SLOPE, DAGGETT

### Boundary Description

**Daggett and Summit counties** - Boundary begins at the Utah-Wyoming state line and the Burn Fork-Birch Creek drainage divide; then east along this state line to the Utah-Wyoming-Colorado state lines (Three corners); south along the Utah-Colorado state line to the Green River; west along the Green River to Flaming Gorge Reservoir; west along the south shore of Flaming Gorge Reservoir to Cart Creek; south along Cart creek to Highway SR-191; south on SR-191 to the Uintah-Daggett County line (summit of the Uinta Mountains); west along this summit to the Burnt Fork-Sheep Creek drainage divide; north along this drainage divide to the Burnt Fork-Birch Creek drainage divide; north along this drainage divide to the Utah-Wyoming state line and beginning point.

### Management Unit Description

The majority of the deer and elk winter range in unit 8 (8A & 8B) is on U.S. Forest Service and BLM managed lands. Privately owned lands comprise about 19% of the winter range, most notably the bottomland in the Lucerne Valley around Manila, Brown's Park, and Clay Basin. Elsewhere, privately owned land is used as rangeland for cattle or for summer homes. Manila and Dutch John are the only towns in sub-unit 8B. BLM lands are used primarily for cattle grazing, with oil and gas operations being the major activities in Clay Basin. Winter range on Forest Service land is mainly part of the Flaming Gorge National Recreation Area. Following construction of the Flaming Gorge dam, approximately 14,000 acres of deer winter range was flooded, but the reservoir does not appear to be a serious barrier to migration (Warren 1973). Concurrently, most livestock grazing was eliminated within the Green River corridor. The area is now managed for recreation and electrical power generation associated with the reservoir.

Because the majority of the land within this herd unit is public, this unit did not rank high on the winter range acquisition list. However, a property boundary survey of DWR land, which included Red Creek and Goslin Mountain, was ranked the top enhancement project in 1990.

### Key Areas

Several important normal winter concentration areas were identified in the 1974 range inventory. They are: Dowd, Bear, and Goslin Mountains; Dutch John Flat, Little Hole, Red Creek Flat, Taylor Flat, Death Valley, and Digger Basin. Even with very generous estimates, these areas provide only about 20% of the winter range, with all being under federal management. The DWR owns some critical lands in Brown's Park (Taylor Flat and Red Creek) and on Goslin Mountain.

### Grazing Summary

Local BLM and Forest Service personnel have provided information on past and current livestock grazing programs. With heavy season-long grazing on the Forest in the first half of the 1900's, cattle grazing since then has been reduced and adjusted downward, in particular since construction of Flaming Gorge Reservoir. There is little cattle use permitted in the Flaming Gorge Recreation Area. Currently, grazing takes place primarily along the southern boundary between the herd unit and Ashley National Forest. Cattle are in the Greendale area in summer, but currently stocking is light at 13.4 suitable acres/AUM. Eighty-five cows graze the allotment on a deferred rotation from June 1<sup>st</sup> to September 30<sup>th</sup>. The Death Valley area in the Sheep Creek Mountain allotment is also lightly stocked at 15.4 suitable acres/AUM. It is currently permitted for 173 cows with calves from June 1 to September 15 on a deferred rotation schedule. The sampled BLM grazing allotments are

generally grazed by cattle in spring and/or summer. Antelope Flat is part of the Goslin Mountain allotment, which is part of a deferred rotation system that is grazed either spring or fall. The higher country on Goslin Mountain, where DWR owns isolated parcels, is grazed from mid-July to early or mid-September on a deferred rotation basis for 400 AUM's.

### Unit Management Objectives

The management plan for Unit 8 (8A & 8B), includes a target herd size of 5,300 wintering deer with a composition of 15 bucks to 100 does. Thirty percent of the bucks are to be 3-point or better. The elk management objective is to achieve a target winter herd size of 2,100 (1,600 in Summit and West Daggett; 500 in the Three Corners) with a minimum post season bull to cow ratio of 8:100. At least 4 of these bulls will be 2 ½ years of age or older.

### Study Site Description

Trend studies were originally established at Cedar Springs (8B-1), Goslin Mountain (8B-2), Bear Top Mountain (8B-3), Greendale (8B-4) and Bennett Ranch (8B-5) in 1982. These sites were reread in 1988 along with 2 new trend studies which were established on BLM land at Antelope Flat (8B-7) and on Forest land at Phil Pico Mountain (8B-8). All of these sites were reread in 1995. Due to heavy livestock use of riparian areas on State land in the Goslin Mountain area, five new trend studies were established in 1995. Most of this heavy use was brought on by the extended drought and poor distribution of livestock. Two studies sample mountain big sagebrush-grass range (West Goslin 8B-9 and Sagebrush Ridge 8B-10) and 3 sites monitor meadows which receive concentrated livestock and elk use (Triangle Meadow 8B-11, Big Meadow 8B-12 and Lower Big Meadow 8B-13). In 2000, all sites were reread except for Cedar Springs which was dropped. One new site was added at Clay Basin Bench (8B-14).

Trend Study 8B-1-00

Study site name: Cedar Springs.

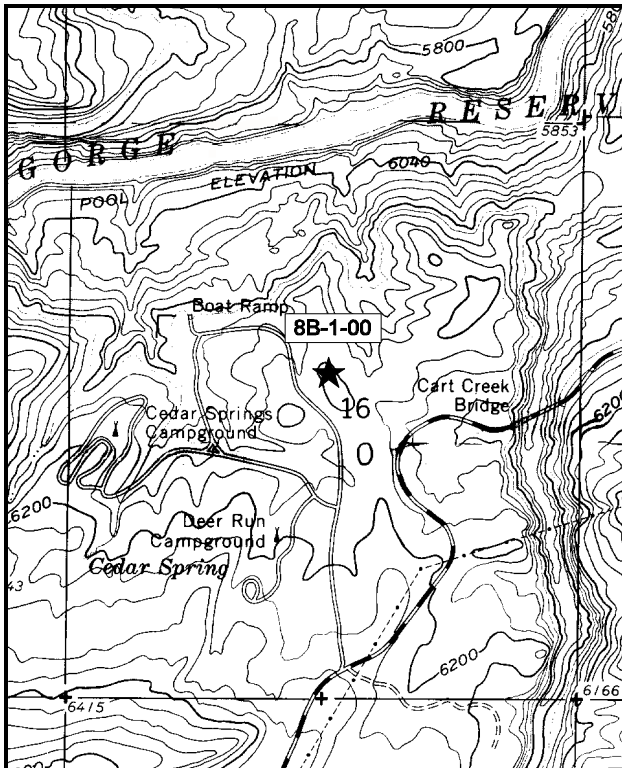
Range type: Pinyon-Juniper .

Compass bearing: frequency baseline 316°M.

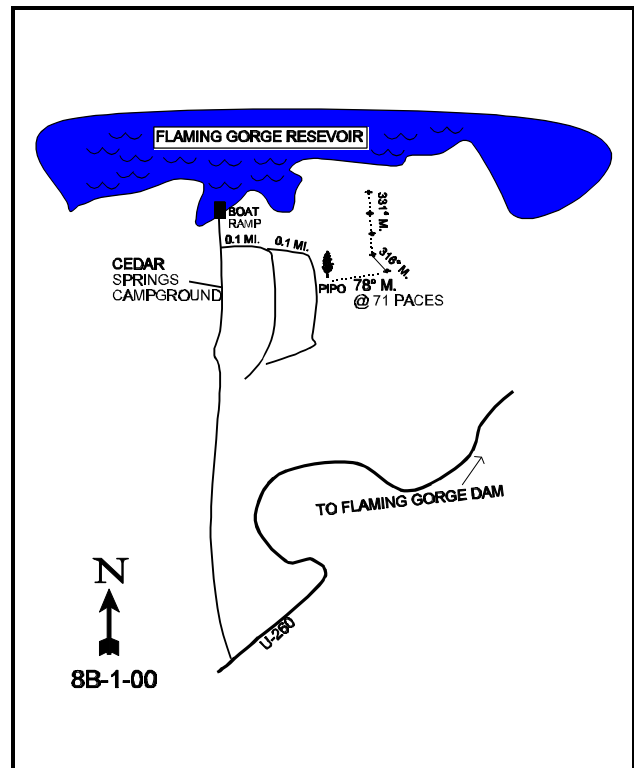
First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

## LOCATION DESCRIPTION

From the intersection of Highway U-260 and the road to Cedar Springs Campground, proceed north towards Cedar Springs Boat Ramp. Turn right (east) just before reaching the boat ramp. Go 0.1 miles to a dirt road on the left. Turn and travel 0.1 miles to a lone Ponderosa pine on the left side of the road. The 0-foot baseline stake is on top of the ridge, 71 paces away at a bearing of 78°M from the pine.

Map Name: Dutch John

Township 2N Range 22E, Section 16



### Diagrammatic Sketch

UTM 4530342 N, 631153 E

## DISCUSSION

### Trend Study No. 8B-1 (9-1)

\*\*\* This site was not read in 2000. Text has been retained in this report but consult the 1995 Utah Big Game Range Trend Studies report for maps and data tables. The site is dominated by pinyon and juniper with a few decadent and dying shrubs in the understory. The site provides good thermal cover but it is not representative of deer winter range. Pellet group data was collected in 2000 and is described below.

The Cedar Springs study is on deer winter range slightly east of the Cedar Springs campground and marina. It samples a pinyon-juniper type on a ridge top with a slight northern aspect. The area is at the lower end of critical winter range south of Flaming Gorge Reservoir at an elevation of 6,050 feet. Use of the area by deer has been intense in the past and pellet group data from 1995 indicates moderate deer use with a quadrat frequency of 38%. Quadrat frequency for elk pellet groups is 14%. A pellet group transect was read along the study site baseline in 2000. It estimates 34 deer and 3 elk days use/acre (84 ddu/ha and 7 edu/ha). A few pellet groups were fresh but most appear to be from winter use.

Soils are sandy to gravelly in texture and moderately shallow. Erosion is apparent from the amount of bare ground, rock and erosion pavement on the surface. Total vegetative cover is only 25%, with the herbaceous species only contributing 14% of the total. Most of the vegetation cover (85% of the browse cover) is contributed by pinyon and juniper trees. As a result, plants are pedestaled and numerous small gullies originate on the small ridge top where the study is located.

Key browse on the site consists of mountain big sagebrush with lesser amounts of antelope bitterbrush. Density of sagebrush was estimated at 2,366 plants/acre in 1982. Eighty percent of these plants were mature, 16% were decadent and only 3% were young. Poor vigor was noted on 12% of the mature plants and on 100% of the decadent individuals (33% classified as dying). Utilization was heavy on 58% of the population. By 1988, density was essentially the same, but 90% of the sagebrush was classified as decadent with 31% of these displaying poor vigor. Utilization was again heavy with 63% of the shrubs sampled showing heavy use. During the 1995 reading, the sagebrush density was estimated at only 1,040 plants/acre. The drop in density came primarily from the decadent age class which declined from 2,133 to only 640 plants/acre. Of these, 81% were classified as dying. After the thinning of the population, most of the mature plants now show good vigor. Those plants showing heavy use dropped to 31%.

Antelope bitterbrush is a preferred species yet it only occurs in small numbers. The population has steadily fallen from 700 plants/acre in 1982 to 266 in 1988 and 140 by 1995. Since 1988, the number of mature plants has remained nearly the same, while all of the decadent plants seem to have died out. Heavy use has declined from a high of 90% in 1982 to 38% by 1988. Use was light to moderate in 1995 with no bitterbrush displaying heavy use.

The downward trends in bitterbrush and sagebrush can be attributed to heavy use combined with prolonged drought and the dominance of pinyon-juniper trees on the site. These trees were not counted in the shrub strips in 1995, but point-center quarter data taken during that year estimate 504 pinyon trees/acre and 121 juniper with an overhead canopy cover of 44%. These trees shade out understory plants and effectively tie up the water and mineral resources.

The herbaceous understory is poor with very low sum nested frequencies of both perennial grasses and forbs. All grasses combined provide only a little over 2% cover. The most common species include bluebunch wheatgrass and cheatgrass brome. Forbs are diverse but combine for a total of barely one percent cover.

### 1982 APPARENT TREND ASSESSMENT

By almost any measure, range condition appears to be declining. Herbaceous vegetative cover is inadequate to hold the soil, and litter is ineffective. Utilization of browse, especially the key species, is heavy and vigor is poor with insufficient reproduction.

### 1988 TREND ASSESSMENT

Aside from small changes in each ground cover category, the percentage of total ground cover is similar. There is almost 28% bare soil. Soil pedestaling is evident on most plants. The 10% cover of erosion pavement is related to past soil loss. Trend for soil is stable but in poor condition. Trends for sagebrush and bitterbrush are both down due to heavy use, poor vigor, high decadency rates, and lack of reproduction. Trend for the herbaceous understory is slightly up due to an increase in the sum quadrat frequency of forbs. Frequency of grasses declined slightly. The understory is in extremely poor condition.

#### TREND ASSESSMENT

soil - stable, but poor condition (3)

browse - down (1)

herbaceous understory - slightly up for forbs, but still poor condition (4)

### 1995 TREND ASSESSMENT

Trend for soil is slightly up due to a decrease in percent bare ground. However, condition is still poor and erosion is continuing. The browse trend is down due to heavy use, poor vigor, high decadency rates, almost no reproduction, a 44% decline in density of sagebrush, and 53% decline in bitterbrush since 1988. The herbaceous understory is in very poor condition but shows a stable trend since the last reading. This site is totally dominated by pinyon and juniper trees which are out competing the understory shrubs. The surviving understory shrubs are in poor condition and heavily hedged due in part to their low numbers. This site needs to be treated. It is not representative of deer winter range.

#### TREND ASSESSMENT

soil - slightly up but in poor condition (4)

browse - down (1)

herbaceous understory - stable but in poor condition (3)

Trend Study 8B-2-00

Study site name: Goslin Mountain.

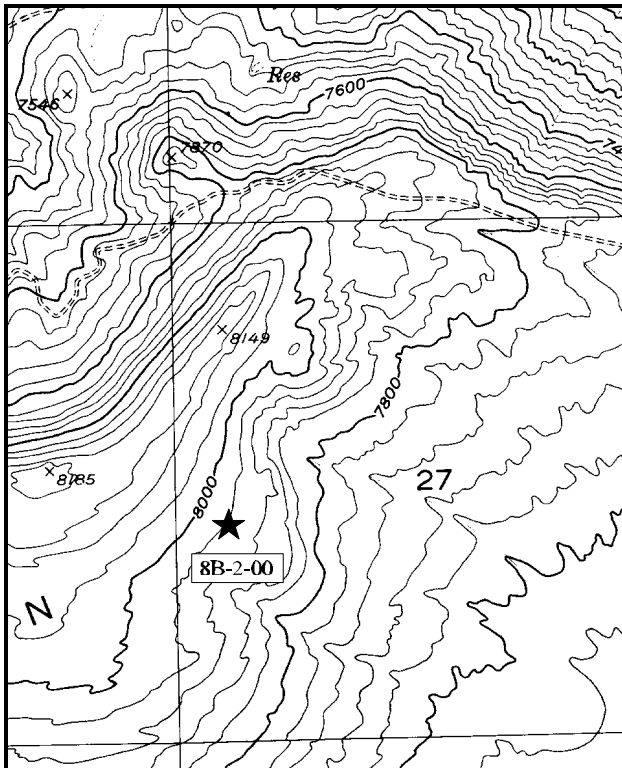
Range type: Big Sagebrush-Grass.

Compass bearing: frequency baseline 18°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

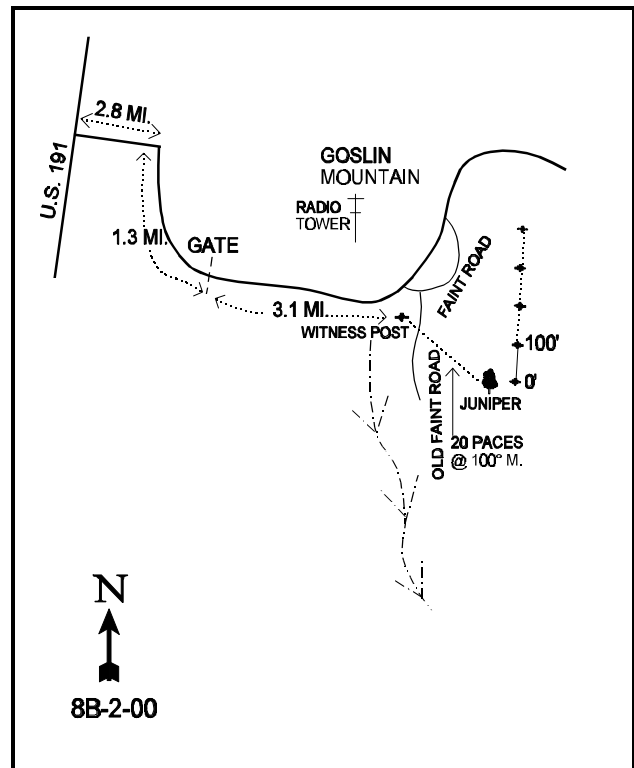
LOCATION DESCRIPTION

From Dutch John, proceed north towards Antelope Flat on Highway U.S. 191 for approximately 8 miles. Before the Wyoming border, turn east on the Antelope Flat Road toward Goslin Mountain. Go 2.8 miles and turn right towards Goslin Mountain. Proceed 1.3 miles to a gate. Continue up the mountain 3.1 miles to a turnoff to the left which goes to a radio tower. A little further down the main road there is a road to the right. Stop here and walk 20 paces down the right fork to a juniper on the left. The 0-foot baseline stake is located two paces east of the juniper.



Map Name: Goslin Mountain

Township 3N, Range 23E, Section 27



Diagrammatic Sketch

UTM 4536284.097 N, 641644.204 E

## DISCUSSION

### Trend study No. 8B-2 (9-2)

The Goslin Mountain trend study samples a mountain big sagebrush-grass site near the summit of Goslin Mountain at an elevation of 7,920 feet. Aspect is to the east-southeast with a gradual slope of 10% to 15%. Deer, elk and antelope utilize the site year-round with less use occurring during severe winters. Cattle grazing is permitted in the area as part of the Goslin Mountain allotment managed by the BLM. Cattle grazing in this area takes place during the summer months on a deferred rotation schedule for 400 AUM's. The area is also considered important habitat for sage grouse. Pellet group quadrat frequency data from 1995 and 2000 indicate light use by elk, deer and cattle. A pellet group transect read along the study site baseline in 2000 estimates 15 deer and 3 elk days use/acre (37 ddu/ha and 7 edu/ha).

Soils are moderately shallow, coarse, rocky and well-drained. Effective rooting depth is estimated at just over 12 inches. Pavement and rocks are not abundant on the surface but occur throughout the profile. Soil texture is sandy loam which has a slightly acid pH (6.2). Phosphorus is limited at 4.6 ppm. Values less than 10 ppm can limit normal plant growth and development. Protective ground cover is abundant and well dispersed. However, there are some signs of past erosion in the form of soil pedestaling around shrubs and the bare areas which occur show some signs of active erosion. Many of these bare areas have very shallow soil at less than 4 inches in depth.

The key browse species on the site consists of a moderately dense stand of mountain big sagebrush which produced over half of the shrub cover in 1995 and 2000. Density has remained relatively stable over the years at around 2,500 plants/acre. The exception would be the increase in young plants in 1988. Use of the sagebrush has been mostly light to moderate with an increase in heavy use in 1995. Percent decadence increased from 3% in 1982 to 52% in 1988. Percent decadency has decreased and stabilized in 1995 and 2000 at just over 1/3 of the population. The proportion of the population showing poor vigor has steadily increased from 0% in 1982 to 18% in 2000. Decadent plants classified as dying numbered 361 plants/acre in 1995 and 320 in 2000. Reproduction needed to replace these plants has been quite variable. No seedlings or young were encountered in 1995. Currently ('00), biotic potential (#of seedlings) is marginal at 9% while young plants account for only 7% of the population.

Other important browse on the site consist of serviceberry, bitterbrush, and snowberry. Bitterbrush currently ('00) numbers 420 plants/acre, and provides 21% of the total shrub cover. They have a prostrate growth form with an average height of less than 2 feet. Bitterbrush currently ('00) shows mostly moderately hedging, has good vigor, and has a low incidence of decadence. The proportion of plants heavily hedged (>60% of twigs browsed) has steadily decreased from 63% in 1982 to 0% in 2000. Currently, two-thirds of the bitterbrush population show moderate use. There are small numbers of serviceberry and snowberry scattered throughout the site which are only lightly utilized.

The herbaceous understory is diverse and abundant. Grasses and forbs accounted for 46% of the total vegetative cover in 1995, increasing to 54% in 2000. Grasses make up the majority of the herbaceous cover, 69% in 1995 and 81% in 2000. The dominant grasses consist of needle-and-thread, oniongrass, Letterman needlegrass, and thickspike wheatgrass. It was reported in 1988 that the Poa's were identified to genus only because of the difficulty identifying grasses that year.

Forbs are also very diverse on the site but none are very abundant. Important species include silver lupine and low penstemon.



## 1982 APPARENT TREND ASSESSMENT

This site appears stable. Soil loss is not currently a serious problem. However, roadways and vehicle tracks are a point source for erosion. Off-road vehicle use should be discouraged if possible. The soil is fairly shallow and has a high erosion potential if disturbed. Shrubs, especially mountain big sagebrush, are the dominant species on the site and will continue to be so. The more preferred species, such as bitterbrush and serviceberry, are both heavily utilized and may eventually decline. Hopefully, ways can be found to prevent this or to encourage their expansion.

## 1988 TREND ASSESSMENT

Ground cover is almost unchanged from 1982. There is adequate litter cover (57%) and basal vegetative cover (12%). Although there is 25% bare ground with some soil movement occurring, especially along trails, the canopy and basal vegetative cover minimize the erosion hazard. Trend for the key browse species, mountain big sagebrush, is stable. Even though the population density has increased, percent decadence has also increased to 52%. The herbaceous understory trend is up due to an increase in the quadrat frequency of perennial grasses and especially forbs.

### TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - up (5)

## 1995 TREND ASSESSMENT

Ground cover characteristics have improved since 1988. Percent litter cover has declined slightly due to prolonged drought, but percent bare ground has also declined from 25% to 17%. The high nested frequency values of vegetation and litter indicate well dispersed cover which protects the soil from serious erosion. The browse trend for mountain big sagebrush is mixed. Population density has declined from 4,866 plants/acre in 1988 to 2,480 by 1995. Much of this decrease can be attributed to the much larger sampling design that gives better estimates for shrub populations. The proportion of plants displaying heavy use and poor vigor have both increased. In addition, no seedlings or young plants were encountered in 1995. On the favorable side, percent decadency has declined from 52% to 33%. Trend is considered slightly down at this time but by the time of the next reading this population will most likely be smaller but more healthy with the continuation of drought. Trend for the herbaceous understory is slightly up with an increase in sum of nested frequency of perennial forbs and stable nested frequency values for the key perennial grasses, thickspike wheatgrass, oniongrass, needle-and-thread and Letterman needlegrass.

### TREND ASSESSMENT

soil - slightly up (4)

browse - slightly down for mountain big sagebrush (2)

herbaceous understory - slightly up (4)

## 2000 TREND ASSESSMENT

Trend for soil is up slightly. Relative percent cover of vegetation increased, while cover of bare ground has declined. As a result, the proportion of protective cover (vegetation, litter and cryptogams) to bare ground has increased from 2.8 : 1 to 3.4 : 1. Erosion is currently not a problem on this site. Trend for the key browse species, mountain big sagebrush and bitterbrush is stable. Both have similar population densities compared to 1995. Use is lighter than 1995 levels and vigor is normal on most plants. Percent decadency on sagebrush is

stable as is the number of decadent plants that are classified as dying (361 plant/acre in 1995 and 320 in 2000). However, reproduction of sagebrush is poor and there is currently not enough young plants to replace all of the decadent and dying. This may lead to a slight decline in the sagebrush population in the future if drought conditions continue. Some of the vigor problems on sagebrush are obviously due to the dry conditions of the past few years. Trend for the herbaceous understory is up for perennial grasses, but slightly down for perennial forbs. Overall, the herbaceous trend is considered slightly up since perennial grasses provide the majority of the herbaceous cover. Needle-and-thread and Letterman needlegrass both declined significantly in nested frequency, while oniongrass increased significantly. Thickspike wheatgrass remained stable.

#### TREND ASSESSMENT

soil - slightly up (4)

browse - stable (3)

herbaceous understory - slightly up (4)

#### HERBACEOUS TRENDS --

Herd unit 08B, Study no: 2

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	136	144	150	58	51	58	55	1.06	2.82
G	Agropyron spicatum	a-	c37	b14	155	-	15	7	.42	.63
G	Agropyron trachycaulum	-	-	6	-	-	-	2	-	.30
G	Bromus carinatus	-	-	6	-	-	-	2	-	.18
G	Bromus tectorum (a)	-	2	-	-	-	1	-	.00	-
G	Carex spp.	22	32	31	-	9	15	13	.88	.75
G	Dactylis glomerata	-	1	-	-	-	1	-	.00	-
G	Koeleria cristata	b11	a-	ab2	-	5	-	1	-	.03
G	Leucopoa kingii	a-	ab3	b7	-	-	2	4	.06	.44
G	Melica bulbosa	a86	a102	b156	50	33	43	59	2.94	3.74
G	Muhlenbergia richardsonis	-	4	3	-	-	3	1	1.01	.00
G	Poa spp.	171	-	-	-	67	-	-	-	-
G	Poa bulbosa	-	3	22	-	-	1	8	.03	.17
G	Poa fendleriana	-	38	87	-	-	16	34	.45	2.25
G	Poa pratensis	-	5	43	-	-	2	15	.06	1.37
G	Poa secunda	-	25	38	43	-	9	15	.09	.36
G	Sitanion hystrix	b63	a-	a-	2	31	-	-	-	-
G	Stipa columbiana	b89	a7	b86	-	35	4	33	.07	2.58
G	Stipa comata	a118	b190	a139	27	51	62	49	4.46	7.60
G	Stipa lettermani	a54	b89	a34	49	25	34	14	1.57	.68
G	Unknown grass - perennial	b14	a-	a-	-	5	-	-	-	-

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
	Total for Annual Grasses	0	2	0	0	0	1	0	0.00	0
	Total for Perennial Grasses	764	680	824	244	312	265	312	13.11	23.96
	Total for Grasses	764	682	824	244	312	266	312	13.12	23.96
F	Achillea millefolium	<sub>b</sub> 15	<sub>a</sub> -	<sub>a</sub> -	3	7	-	-	-	-
F	Agoseris glauca	<sub>a</sub> -	<sub>b</sub> 53	<sub>b</sub> 64	-	-	26	26	.28	1.06
F	Allium spp.	<sub>a</sub> 21	<sub>b</sub> 139	<sub>a</sub> 35	-	9	61	18	.81	.12
F	Antennaria rosea	<sub>b</sub> 14	<sub>a</sub> 3	<sub>ab</sub> 9	1	7	1	5	.00	.07
F	Arabis spp.	3	3	2	-	3	1	1	.00	.00
F	Arenaria congesta	<sub>a</sub> 1	<sub>b</sub> 20	<sub>b</sub> 31	1	1	10	12	.20	.33
F	Astragalus argophyllus	<sub>a</sub> 3	<sub>a</sub> 5	<sub>b</sub> 15	3	1	2	7	.01	.13
F	Aster chilensis	16	16	7	-	7	7	4	.06	.07
F	Chaenactis douglasii	-	3	-	-	-	1	-	.00	-
F	Collomia linearis (a)	-	<sub>b</sub> 151	<sub>a</sub> 37	-	-	61	17	.75	.25
F	Comandra pallida	-	-	1	-	-	-	1	-	.00
F	Collinsia parviflora (a)	-	<sub>b</sub> 234	<sub>a</sub> 22	-	-	83	9	1.48	.09
F	Crepis acuminata	3	5	3	-	1	4	2	.04	.03
F	Cymopterus longipes	<sub>a</sub> -	<sub>b</sub> 19	<sub>b</sub> 12	-	-	10	5	.05	.10
F	Delphinium nuttallianum	-	1	2	-	-	1	1	.00	.00
F	Descurainia pinnata (a)	-	5	6	-	-	2	3	.01	.01
F	Erigeron eatonii	<sub>a</sub> -	<sub>a</sub> 7	<sub>b</sub> 28	-	-	2	13	.04	.11
F	Erigeron flagellaris	<sub>b</sub> 94	<sub>a</sub> 11	<sub>a</sub> 5	16	39	7	3	.06	.06
F	Eriogonum umbellatum	<sub>b</sub> 46	<sub>a</sub> 3	<sub>a</sub> 14	9	20	2	6	.02	.25
F	Gilia inconspicua (a)	-	4	-	-	-	1	-	.00	-
F	Heterotheca villosa	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 8	-	-	-	3	.03	.06
F	Lomatium spp.	-	4	-	-	-	2	-	.01	-
F	Lupinus argenteus	35	44	37	4	17	21	20	.51	.80
F	Microsteris gracilis (a)	-	31	29	-	-	15	10	.15	.07
F	Penstemon humilis	<sub>a</sub> -	<sub>b</sub> 7	<sub>b</sub> 5	-	-	3	3	.16	.06
F	Petradoria pumila	-	-	1	-	-	-	1	-	.03
F	Phlox longifolia	<sub>b</sub> 117	<sub>a</sub> 73	<sub>a</sub> 70	-	51	32	30	.36	.40
F	Polygonum douglasii (a)	-	<sub>b</sub> 71	<sub>a</sub> 33	-	-	30	13	.17	.06
F	Senecio integerrimus	<sub>a</sub> -	<sub>b</sub> 13	<sub>a</sub> 2	-	-	8	1	.09	.00
F	Senecio multilobatus	-	4	-	-	-	2	-	.03	-
F	Taraxacum officinale	<sub>a</sub> 4	<sub>b</sub> 36	<sub>a</sub> 13	-	2	15	6	.25	.22
F	Tragopogon dubius	-	3	5	-	-	1	2	.00	.06
F	Trifolium gymnocarpon	<sub>a</sub> 8	<sub>b</sub> 57	<sub>b</sub> 63	18	4	25	23	.15	.80
F	Unknown forb-perennial	<sub>b</sub> 33	<sub>a</sub> -	<sub>a</sub> -	-	19	-	-	-	-
F	Viola spp.	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 12	-	-	-	5	-	.24

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Zigadenus paniculatus	8	2	-	-	4	1	-	.00	-
	Total for Annual Forbs	0	496	127	0	0	192	52	2.57	0.50
	Total for Perennial Forbs	421	531	444	55	192	245	198	3.21	5.09
	Total for Forbs	421	1027	571	55	192	437	250	5.78	5.59

Values with different subscript letters are significantly different at  $\alpha = 0.10$

#### BROWSE TRENDS --

Herd unit 08B, Study no: 2

T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Amelanchier alnifolia	3	4	.30	1.54
B	Artemisia tridentata vaseyana	72	72	13.53	12.76
B	Chrysothamnus viscidiflorus lanceolatus	7	7	.42	.18
B	Eriogonum heracleoides	51	54	3.26	1.81
B	Gutierrezia sarothrae	3	0	.15	-
B	Mahonia repens	12	5	.48	.15
B	Purshia tridentata	15	20	3.13	5.00
B	Symphoricarpos oreophilus	10	8	.72	2.87
	Total for Browse	173	170	22.01	24.33

#### CANOPY COVER --

Herd unit 08B, Study no: 2

Species	Percent Cover	
	'95	'00
Juniperus scopulorum	-	2

#### BASIC COVER --

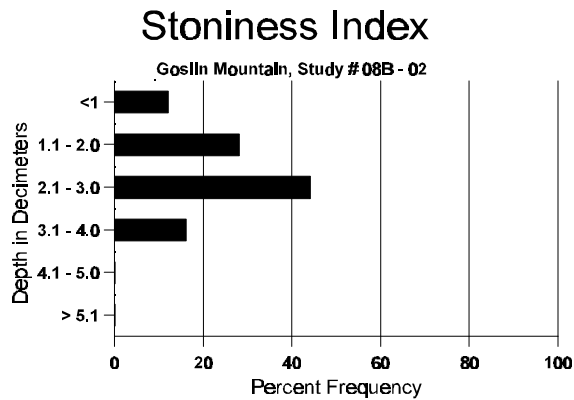
Herd unit 08B, Study no: 2

Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	363	370	8.50	12.00	41.94	57.47
Rock	149	80	2.75	2.00	3.28	5.05
Pavement	107	133	0	3.00	.84	2.42
Litter	395	384	60.25	57.50	50.97	58.79
Cryptogams	13	32	1.00	.25	.10	.38
Bare Ground	278	229	27.50	25.25	16.86	12.69

# SOIL ANALYSIS DATA --

Herd Unit 8B, Study # 2, Study Name: Goslin Mountain

Effective rooting depth (inches)	Temp °F (depth)	pH	% sand	% silt	% clay	% OM	PPM P	PPM K	dS/m
12.44	53.0 (14.02)	6.2	69.3	16.2	14.6	2.6	4.6	121.6	0.5



# PELLET GROUP FREQUENCY --

Herd unit 08B, Study no: 2

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre 00	Days Use per Acre (ha) 00
Rabbit	-	1	35	N/A
Elk	3	1	44	3 (8)
Deer	7	4	191	15 (36)
Cattle	5	3	-	-

## BROWSE CHARACTERISTICS --

Herd unit 08B, Study no: 2

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Amelanchier alnifolia																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	1	-	-	-	2	-	-	-	-	3	-	-	-	60	17	37	3
	00	3	-	-	1	-	-	-	-	-	4	-	-	-	80	30	50	4
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	1	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		50%			25%			00%			+ 0%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	0%			
												'88	0		0%			
												'95	80		25%			
												'00	80		0%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia tridentata vaseyana																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	10	-	-	1	-	-	-	-	-	-	-	-	-	733		11	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	8	-	-	3	-	-	-	-	-	-	-	-	-	220		11	
Y	82	2	-	-	-	-	-	-	-	-	-	-	-	-	133		2	
	88	14	1	-	-	-	-	-	-	-	-	-	-	-	1000		15	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	9	-	-	-	-	-	-	-	-	-	-	-	-	180		9	
M	82	32	-	-	-	-	-	-	-	-	-	-	-	-	2133	27 33	32	
	88	8	12	-	-	-	-	-	-	-	-	-	-	-	1333	27 39	20	
	95	19	35	22	1	5	1	-	-	-	-	-	-	-	1660	51 59	83	
	00	55	10	1	2	3	-	-	-	-	-	-	-	-	1420	23 36	71	
D	82	1	-	-	-	-	-	-	-	-	-	-	-	-	66		1	
	88	22	15	-	-	-	1	-	-	-	-	-	-	-	2533		38	
	95	5	19	11	-	6	-	-	-	-	-	-	18	-	820		41	
	00	33	2	1	9	-	-	-	-	-	-	-	16	-	900		45	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	800		40	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	640		32	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			+52%							
'88		38%			01%			04%			-49%							
'95		52%			27%			15%			+ 1%							
'00		12%			02%			18%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	2332	Dec:	3%			
												'88	4866		52%			
												'95	2480		33%			
												'00	2500		36%			
Chrysothamnus viscidiflorus lanceolatus																		
M	82	3	-	-	-	-	-	-	-	-	3	-	-	-	200	9 7	3	
	88	1	-	-	1	-	-	-	-	-	2	-	-	-	133	15 7	2	
	95	9	-	-	1	-	-	-	-	-	10	-	-	-	200	12 21	10	
	00	11	-	-	-	-	-	-	-	-	11	-	-	-	220	9 13	11	
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%			+ 1%							
'95		00%			00%			00%			+ 9%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	200	Dec:	0%			
												'88	199		33%			
												'95	200		0%			
												'00	220		0%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Eriogonum heracleoides																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	24	-	-	-	-	-	-	-	-	24	-	-	-	480		24	
	00	6	-	-	-	-	-	-	-	-	6	-	-	-	120		6	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	125	-	-	-	-	-	-	-	-	125	-	-	-	2500	7	125	
	00	113	-	-	12	-	-	-	-	-	125	-	-	-	2500	5	125	
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	1	-	-	-	-	-	-	-	-	-	1	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			.66%			.66%			-13%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	0%			
												'88	0		0%			
												'95	3000		1%			
												'00	2620		0%			
Gutierrezia sarothrae																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	9	-	-	-	-	-	-	-	-	9	-	-	-	180	4	9	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	180		-			
												'00	0		-			



A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Mahonia repens																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	20	4	-	2	-	-	3	-	-	29	-	-	-	1933		29	
	95	50	-	-	-	-	-	-	-	-	50	-	-	-	1000		50	
	00	12	-	-	-	-	-	-	-	-	12	-	-	-	240		12	
M	82	9	-	-	-	-	-	-	-	-	9	-	-	-	600	5	4	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	95	95	-	-	-	-	-	-	-	-	95	-	-	-	1900	4	6	
	00	16	-	-	-	-	-	-	-	-	16	-	-	-	320	4	4	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			+69%							
'88		14%			00%			00%			+33%							
'95		00%			00%			00%			-81%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	600	Dec:	-			
												'88	1933		-			
												'95	2900		-			
												'00	560		-			
Purshia tridentata																		
Y	82	-	1	1	-	-	-	-	-	-	1	1	-	-	133		2	
	88	-	3	-	1	-	-	-	-	-	1	-	3	-	266		4	
	95	1	1	-	1	-	-	-	-	-	3	-	-	-	60		3	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
M	82	1	1	4	-	-	-	-	-	-	4	2	-	-	400	11	21	
	88	-	1	4	-	1	2	-	-	-	8	-	-	-	533	14	22	
	95	-	4	7	-	4	2	-	-	-	17	-	-	-	340	13	45	
	00	4	9	-	-	4	-	-	-	-	17	-	-	-	340	20	63	
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	1	-	-	-	-	1	-	-	1	40		2	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		25%			63%			00%			+33%							
'88		42%			50%			25%			-50%							
'95		45%			45%			00%			+ 5%							
'00		67%			00%			05%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	533	Dec:	0%			
												'88	799		0%			
												'95	400		0%			
												'00	420		10%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Symphoricarpos oreophilus																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	7	-	-	-	-	-	-	-	-	7	-	-	-	140		7	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	8	-	-	5	-	-	-	-	-	13	-	-	-	260	15 41	13	
	00	4	-	-	3	-	-	1	-	-	7	-	1	-	160	24 63	8	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%			-60%							
'00		00%			00%			13%										
Total Plants/Acre (excluding Dead & Seedlings)														'82	0	Dec:	-	
														'88	0		-	
														'95	400		-	
														'00	160		-	

### Trend Study 8B-3-00

Study site name: Bear Top Mountain .

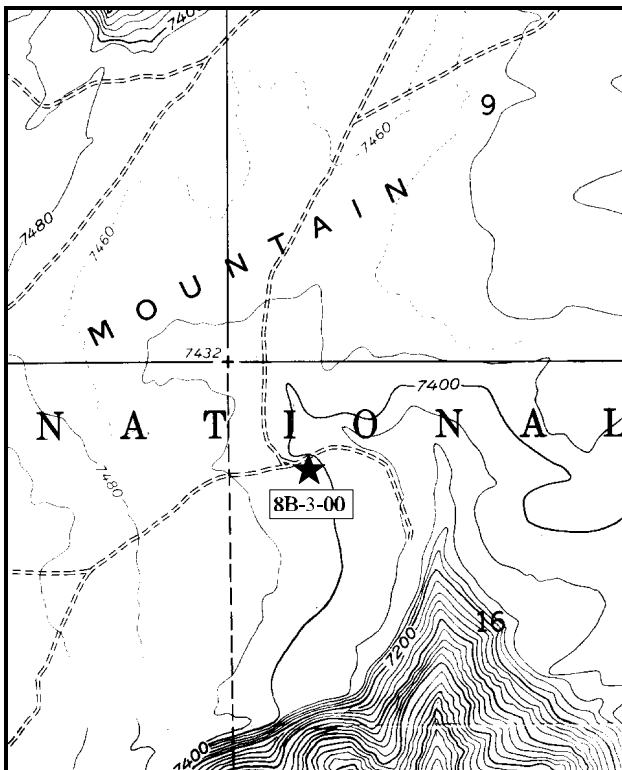
Range type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 165°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

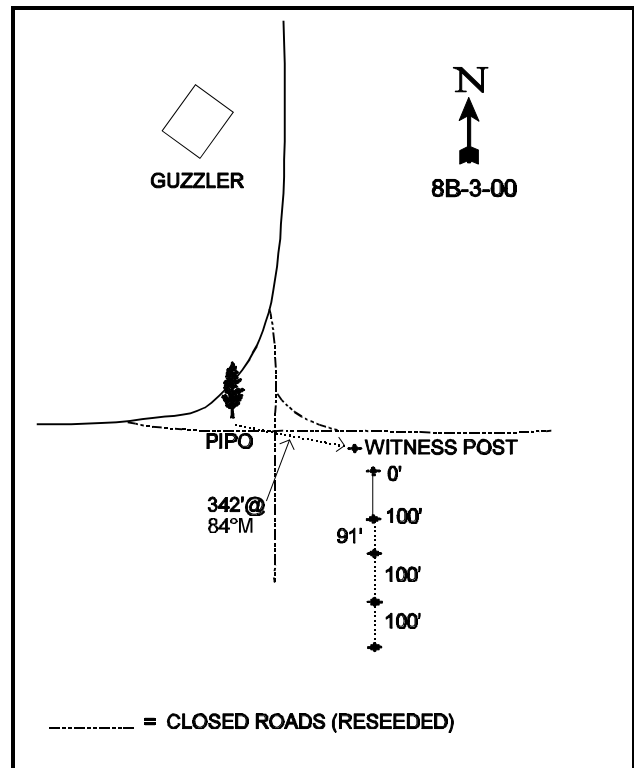
### LOCATION DESCRIPTION

From the intersection of Highway U-260 and U.S. 191 northwest of Dutch John, proceed west towards Antelope Flat campground for 3.6 miles. Turn left, and proceed on the dirt road towards Bear Top Mountain for 0.35 miles to a locked gate. Go through the gate and continue 0.1 miles to a new fence. Continue up the mountain approximately 5.2 miles to a large Ponderosa pine. From the pine, the witness post is 342 feet at 84°M. The 0-foot stake is 13 feet south of the witness post. It is marked with a red browse tag #7095.



Map Name: Flaming Gorge

Township 2N, Range 21E, Section 16



Diagrammatic Sketch

UTM 4530102.930 N, 620962.749 E

## DISCUSSION

### Trend Study No. 8B-3 (9-3)

The Bear Top Mountain study is on Bear Top Mountain at an elevation of 7,400 feet. The site is on nearly level terrain with a slight southeast aspect and lies about 1/4 mile from the cliffs overlooking Flaming Gorge Reservoir. The area is classified as a sagebrush-grass type, which demonstrates great diversity in both vegetative composition and wildlife use. Antelope, mule deer, elk, bighorn sheep, and sage grouse have been observed in close proximity to the site during past readings. Rocky Mountain bighorn sheep were transplanted in the early 1980's and utilize the area as summer range. Two nearby guzzlers provide water for wildlife. Livestock have been excluded since the early 1960's. The area was burned in 1998 as part of a prescribed fire to clear the rim of Bear Top Mountain for big horn sheep habitat. However, the fire eliminated most of the shrubs on the site. Pellet group transect data collected near the trend study baseline in 2000 estimate 7 elk days use/acre (18 edu/ha). In addition, sage grouse, coyote, and marmot droppings were all sampled in the pellet group transect as well.

Soil on the site is moderately shallow and very rocky. Effective rooting depth is estimated at just over 10 inches with most of the rock found in the top 8 inches of the soil profile. Bed rock is also exposed in many places on the surface with rock and pavement providing nearly 14% cover. Soil texture is a sandy loam which has a neutral pH. Phosphorus is limited at only 4.5 ppm. Values less than 10 ppm can limit normal plant growth and development. Due to the levelness of the terrain, erosion is not a problem on this site. Between 1995 and 2000, vegetation and litter both decreased sharply, while bare ground tripled over the same period. These drastic changes are due mostly to the loss of vegetative cover, especially browse cover, following the burn that occurred between the two sampling periods. However, this effect has also been made more severe by the drought that occurred during the fall of 1999, and the winter and spring of 2000.

The key browse species prior to the fire was a moderately dense stand of mountain big sagebrush which made up 81% of the browse cover in 1995. Other browse species included bitterbrush, mountain low rabbitbrush, gray horsebrush, and low numbers of broom snakeweed. Mountain big sagebrush cover was estimated at 19% in 1988 and 15% in 1995. Density has ranged from 9,065 plants/acre in 1988 to 5,200 in 1995. The number of young and decadent sagebrush fluctuated between 1982 and 1995, but the number of mature plants remained stable at around 4,000 individuals/acre. Percent decadency was low at 11% in 1995 with normal vigor on all but 36% of the decadent shrubs which were classified as dying. Use was light to moderate in 1982 and 1988, but heavy in 1995 with 60% of the plants displaying heavy use (>60% of twigs browsed).

Antelope bitterbrush was picked up in the larger sample used in 1995. Density was estimated at 120 mature plants/acre, 50% of which were heavily hedged. Even at this moderately low density, bitterbrush made up 14% of the total browse cover in 1995, making it the second most productive browse species. Mountain low rabbitbrush was fairly common but mostly unutilized. The change in density between 1988 and 1995 is primarily the result of the greatly increased sample size which better estimates shrubs with clumped or discontinuous distributions.

After the area was burned in 1998, total shrub cover declined from 18% in 1995 to 2% in 2000. Due to the spotty nature of the fire, some sagebrush survived. Density of mountain big sagebrush is currently ('00) estimated at 320 plants/acre. Use is light to moderate and vigor is normal on most plants. However, percent decadence has increased to 44%. One seedling and no young plants were sampled in 2000. There are also a few surviving and/or resprouting bitterbrush, fendler ceanothus, and gray horsebrush. The most common shrub on the site is the resprouting mountain low rabbitbrush which numbers 880 plants/acre. They are small plants averaging only 4 inches in height. They show no use and good vigor.

Grasses and forbs are abundant and diverse. Ten perennial grasses were encountered in 1995 which provided 20% of the vegetative cover. The most numerous species included: mutton bluegrass, needle-and-thread, Sandberg bluegrass, and thickspike wheatgrass. Forbs provided 36% of the vegetative cover with 27 perennial and 7 annual species sampled in 1995. Sulfur eriogonum and silvery lupine were numerous and provided good forage for summering big game animals. After the burn, the grass composition was basically unchanged except that total grass cover increased from 8% in 1995 to 14% in 2000. Forbs are still diverse yet the sum of nested frequency and cover have declined by about 50%. Sulfur eriogonum, silvery lupine, rock goldenrod and phlox are still the dominant perennial species. Much of the lupine was heavily utilized in 2000.

#### 1982 APPARENT TREND ASSESSMENT

The overall range trend appears stable. Soil trend may even be improving as a result of level terrain and the withdrawal of livestock grazing. Vegetatively, the area supports a fair density of rather low-growing mountain big sagebrush with a strong grass understory which may be equally dominant. At this point, it is difficult to judge which vegetative element is gaining the upper hand. Future readings of the study should provide some useful data in this regard.

#### 1988 TEND ASSESSMENT

Basal vegetative cover has remained stable, although protective ground cover of litter and cryptogams has increased only slightly. Percent bare ground is currently estimated at 19%. Due to the level terrain and abundant vegetation and litter cover, erosion is not a problem. Trend for soil is slightly improved. The browse trend is up with an increase in population density of the key browse species, mountain big sagebrush. Percent decadency has increased, but 28% of the population is classified as young. The herbaceous trend is also up with an increase in the quadrat frequency of grasses and forbs.

##### TREND ASSESSMENT

soil - slightly up (4)

browse - up (5)

herbaceous understory - up (5)

#### 1995 TREND ASSESSMENT

Ground cover characteristics have changed somewhat since 1988. Percent cover of rock has increased while litter cover has declined. Much of this can be attributed to the prolonged drought we have been experiencing since the late 1980's. Percent bare ground has remained low and is currently 17%. Trend for soil is considered stable. Trend for browse is also currently stable. The number of young and decadent plants have fluctuated considerably over the past readings, but the number of mature plants has remained constant at about 4,000 plants/acre. Percent decadency is currently low at 11% with vigor being generally good. The only negative aspect is the high number of heavily hedged sagebrush (60%) and the number of decadent plants (560 plants/acre) in which 36% were classified as dying. Trend for the herbaceous understory is slightly down due to a decline in the sum of nested frequency for perennial grasses and forbs.

##### TREND ASSESSMENT

soil - stable (3)

browse - stable for sagebrush (3)

herbaceous understory - slightly down (2)

## 2000 TREND ASSESSMENT

Trend for soil is currently down. Since the fire in 1998, percent cover of vegetation and litter have declined considerably while percent cover for bare ground has increased from 17% to 50%. Herbaceous vegetation is still abundant. However, erosion is minimized due to the level terrain. The ratio of protective ground cover (vegetation, litter, and cryptogams) to bare soil decreased from 3.4:1 to 2:1 in 2000. Trend for browse is also down with some sagebrush and bitterbrush surviving the fire. Use on the surviving shrubs is light to moderate with percent decadence increasing to 44%. Vigor is normal on most plants. Currently, there is no recruitment of young plants. The resprouting mountain low rabbitbrush is currently the most abundant shrub at 880 plants/acre. These are small plants averaging only 4 inches in height. Trend for the herbaceous understory is mixed. The herbaceous species composition remained basically unchanged following the fire. However, the sum of nested frequency for perennial grasses have increased while frequency of forbs has declined. In 1995, annual and perennial forbs accounted for 64% of the herbaceous understory. After the fire, perennial forbs account for 32% of the herbaceous cover while perennial grasses provide 63%. Some of decline in forb frequency is obviously due to the fire although drought has also greatly influenced the outcome. The herbaceous trend is considered down slightly.

### TREND ASSESSMENT

soil - down (1)

browse - down due to fire (1)

herbaceous understory - slightly down overall, up for grasses but down for forbs (2)

HERBACEOUS TRENDS --  
Herd unit 08B, Study no: 3

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	a <sup>-</sup>	b <sup>118</sup>	c <sup>191</sup>	-	-	50	70	1.03	2.88
G	Agropyron spicatum	b <sup>208</sup>	a <sup>77</sup>	a <sup>68</sup>	20	78	31	27	.96	1.82
G	Bromus inermis	-	-	-	-	-	-	-	-	.00
G	Bromus tectorum (a)	-	a <sup>26</sup>	b <sup>55</sup>	-	-	13	23	.21	.65
G	Carex spp.	b <sup>72</sup>	a <sup>17</sup>	a <sup>16</sup>	20	31	11	7	.15	.52
G	Koeleria cristata	b <sup>119</sup>	a <sup>13</sup>	a <sup>9</sup>	33	53	8	4	.09	.04
G	Poa fendleriana	111	128	129	-	48	50	50	2.51	2.37
G	Poa secunda	b <sup>166</sup>	a <sup>105</sup>	a <sup>136</sup>	27	69	44	53	1.27	1.12
G	Sitanion hystrix	a <sup>14</sup>	b <sup>41</sup>	b <sup>34</sup>	21	8	18	18	.45	.82
G	Sporobolus cryptandrus	-	7	-	-	-	2	-	.15	-
G	Stipa comata	129	82	111	29	58	36	49	1.50	3.74
G	Stipa lettermani	b <sup>39</sup>	a <sup>-</sup>	b <sup>2</sup>	7	15	-	1	-	.15
Total for Annual Grasses		0	26	55	0	0	13	23	0.20	0.65
Total for Perennial Grasses		858	588	696	157	360	250	279	8.15	13.49
Total for Grasses		858	614	751	157	360	263	302	8.36	14.14
F	Agoseris glauca	a <sup>-</sup>	b <sup>27</sup>	c <sup>63</sup>	-	-	11	26	.05	.48
F	Allium spp.	a <sup>-</sup>	b <sup>10</sup>	a <sup>-</sup>	-	-	6	-	.03	-
F	Antennaria rosea	b <sup>124</sup>	a <sup>41</sup>	a <sup>30</sup>	59	51	17	13	.86	.33
F	Androsace septentrionalis (a)	-	2	-	-	-	2	-	.01	-
F	Arabis spp.	11	3	2	1	5	1	1	.00	.00
F	Arenaria congesta	ab <sup>7</sup>	b <sup>17</sup>	a <sup>3</sup>	-	3	8	1	.23	.15
F	Astragalus convallarius	b <sup>7</sup>	b <sup>14</sup>	a <sup>-</sup>	3	4	5	-	.10	-
F	Aster spp.	a <sup>-</sup>	b <sup>23</sup>	a <sup>-</sup>	-	-	10	-	.12	-
F	Balsamorhiza sagittata	5	9	11	11	2	7	6	.69	.68
F	Calochortus nuttallii	-	3	-	-	-	1	-	.00	-
F	Comandra pallida	-	13	14	9	-	6	8	.25	.09
F	Collinsia parviflora (a)	-	b <sup>148</sup>	a <sup>100</sup>	-	-	47	41	2.28	.30
F	Crepis acuminata	a <sup>-</sup>	b <sup>9</sup>	a <sup>-</sup>	-	-	6	-	.03	-
F	Cymopterus spp.	a <sup>-</sup>	b <sup>10</sup>	a <sup>-</sup>	1	-	5	-	.05	-
F	Descurainia pinnata (a)	-	-	1	-	-	-	1	-	.00
F	Draba spp. (a)	-	12	1	-	-	5	1	.02	.00
F	Erigeron flagellaris	-	2	5	-	-	1	2	.00	.06
F	Erigeron pumilus	b <sup>83</sup>	a <sup>20</sup>	a <sup>6</sup>	30	40	10	3	.19	.04
F	Eriogonum umbellatum	b <sup>79</sup>	b <sup>78</sup>	a <sup>30</sup>	22	33	31	17	2.25	1.48
F	Gayophytum ramosissimum (a)	-	8	7	-	-	4	3	.02	.01
F	Gilia aggregata	-	-	-	1	-	-	-	-	-

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Heterotheca villosa	<sub>ab</sub> 31	<sub>b</sub> 50	<sub>a</sub> 20	8	12	21	8	.83	.22
F	Lepidium spp. (a)	-	<sub>b</sub> 9	<sub>a</sub> -	-	-	5	-	.02	-
F	Linum lewisii	<sub>b</sub> 38	<sub>a</sub> 4	<sub>a</sub> 6	-	24	2	3	.01	.01
F	Lithospermum ruderales	18	4	8	-	7	2	4	.19	.04
F	Lupinus argenteus	<sub>b</sub> 176	<sub>a</sub> 100	<sub>a</sub> 91	28	75	44	41	1.97	1.92
F	Machaeranthera canescens	<sub>b</sub> 7	<sub>a</sub> -	<sub>a</sub> -	-	4	-	-	-	-
F	Mertensi fusiformis	-	-	1	-	-	-	1	-	.00
F	Orthocarpus tolmiei (a)	-	<sub>b</sub> 35	<sub>a</sub> 7	-	-	15	3	.15	.04
F	Penstemon humilis	<sub>b</sub> 11	<sub>a</sub> -	<sub>a</sub> 1	3	6	-	1	-	.03
F	Petrorhiza pumila	<sub>a</sub> 7	<sub>b</sub> 31	<sub>ab</sub> 17	3	6	14	9	1.41	.86
F	Phlox longifolia	<sub>b</sub> 59	<sub>a</sub> 3	<sub>a</sub> 7	-	25	2	3	.01	.04
F	Phlox multiflora	<sub>b</sub> 66	<sub>ab</sub> 66	<sub>a</sub> 30	37	28	23	14	2.30	.26
F	Polygonum douglasii (a)	-	<sub>b</sub> 60	<sub>a</sub> -	-	-	27	-	.13	-
F	Senecio integerrimus	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 6	-	-	-	3	-	.01
F	Sedum lanceolatum	<sub>b</sub> 76	<sub>b</sub> 100	<sub>a</sub> 24	16	36	40	10	.42	.10
F	Trifolium gymnocarpon	18	16	7	24	9	7	3	.03	.01
F	Zigadenus spp.	4	-	-	-	2	-	-	-	-
Total for Annual Forbs		0	274	116	0	0	105	49	2.65	0.37
Total for Perennial Forbs		827	653	382	255	372	280	177	12.10	6.86
Total for Forbs		827	927	498	255	372	385	226	14.75	7.24

Values with different subscript letters are significantly different at  $\alpha = 0.10$

#### BROWSE TRENDS --

Herd unit 08B, Study no: 3

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia tridentata vaseyana	88	9	14.65	1.29
B	Ceanothus fendleri	0	1	-	.18
B	Chrysothamnus viscidiflorus lanceolatus	25	21	.75	.20
B	Gutierrezia sarothrae	3	4	-	.21
B	Juniperus osteosperma	-	-	.15	-
B	Pediocactus simpsonii	10	6	.01	.02
B	Purshia tridentata	6	1	2.59	.01
B	Tetradymia canescens	4	1	.03	.00
Total for Browse		136	43	18.19	1.91



# BASIC COVER --

Herd unit 08B, Study no: 3

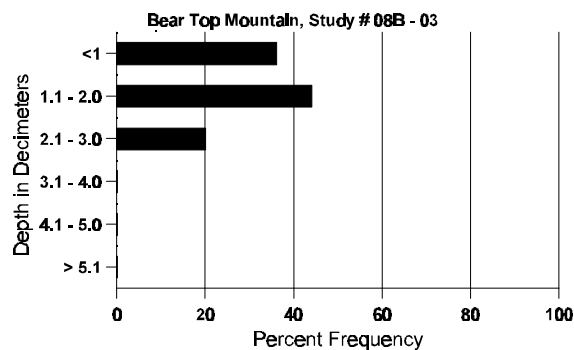
Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	362	322	12.00	12.00	38.31	27.03
Rock	118	120	1.00	4.75	11.07	13.54
Pavement	26	98	0	0	.04	.57
Litter	386	348	58.25	59.75	46.33	23.65
Cryptogams	140	38	2.25	4.50	3.25	.76
Bare Ground	259	357	26.50	19.00	16.85	49.63

# SOIL ANALYSIS DATA --

Herd Unit 8B, Study # 3, Study Name: Bear Top Mountain

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
10.43	57.2 (10.94)	6.8	65.4	19.7	14.9	2.2	4.5	201.6	0.9

# Stoniness Index



# PELLET GROUP FREQUENCY --

Herd unit 08B, Study no: 3

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre 00	Days Use per Acre (ha) 00
Rabbit	3	6	9	N/A
Moose	-	15	287	16 (39)
Grouse	-	2	9	N/A
Elk	7	5	96	7 (18)
Deer	16	5	-	-
Antelope	-	4	313	24 (60)
Coyote	-	2	-	-

## BROWSE CHARACTERISTICS --

Herd unit 08B, Study no: 3

Area Unit 66B, Study No. 3																		
A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Amelanchier alnifolia																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	13	21	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>				<u>Heavy Use</u>				<u>Poor Vigor</u>				<u>%Change</u>				
'82		00%				00%				00%								
'88		00%				00%				00%								
'95		00%				00%				00%								
'00		00%				00%				00%								
Total Plants/Acre (excluding Dead & Seedlings)															'82	0	Dec:	-
															'88	0		-
															'95	0		-
															'00	0		-
Artemisia tridentata vaseyana																		
S	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	82	20	3	-	-	-	-	-	-	-	23	-	-	-	1533			23
	88	25	13	-	-	-	-	-	-	-	36	-	2	-	2533			38
	95	2	9	21	-	-	-	-	-	-	31	-	-	1	640			32
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	49	14	-	-	-	-	-	-	-	63	-	-	-	4200	15	24	63
	88	33	31	-	-	-	-	-	-	-	64	-	-	-	4266	16	18	64
	95	15	46	114	-	21	4	-	-	-	200	-	-	-	4000	15	29	200
	00	5	4	-	-	-	-	-	-	-	5	4	-	-	180	12	29	9
D	82	4	3	1	-	-	-	-	-	-	6	-	2	-	533			8
	88	19	13	2	-	-	-	-	-	-	33	-	1	-	2266			34
	95	-	4	14	-	7	3	-	-	-	18	-	-	10	560			28
	00	5	2	-	-	-	-	-	-	-	6	-	-	1	140			7
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	380			19
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3
% Plants Showing		<u>Moderate Use</u>				<u>Heavy Use</u>				<u>Poor Vigor</u>				<u>%Change</u>				
'82		21%				01%				02%				+31%				
'88		42%				01%				02%				-43%				
'95		33%				60%				04%				-94%				
'00		38%				00%				06%								
Total Plants/Acre (excluding Dead & Seedlings)															'82	6266	Dec:	9%
															'88	9065		25%
															'95	5200		11%
															'00	320		44%

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Ceanothus fendleri																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	1	-	-	-	-	-	1	-	-	-	20	8	18	1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	0		-			
												'00	20		-			
Chrysothamnus viscidiflorus lanceolatus																		
S	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	16	-	-	-	-	-	-	-	-	16	-	-	-	1066			16
	88	26	2	-	2	-	-	-	-	-	29	-	1	-	2000			30
	95	1	-	-	1	-	-	-	-	-	2	-	-	-	40			2
	00	15	-	-	-	-	-	-	-	-	15	-	-	-	300			15
M	82	13	-	-	-	-	-	-	-	-	13	-	-	-	866	8	12	13
	88	14	-	-	3	-	-	-	-	-	14	-	3	-	1133	9	11	17
	95	40	-	-	4	-	-	-	-	-	44	-	-	-	880	10	15	44
	00	29	-	-	-	-	-	-	-	-	29	-	-	-	580	4	5	29
D	82	6	-	-	-	-	-	-	-	-	-	-	6	-	400			6
	88	3	2	1	-	-	-	-	-	-	5	-	1	-	400			6
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			17%			+34%							
'88		08%			02%			09%			-73%							
'95		00%			00%			00%			- 6%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	2332	Dec:	17%			
												'88	3533		11%			
												'95	940		2%			
												'00	880		0%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Gutierrezia sarothrae																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	1	-	-	-	-	-	-	-	-	-	-	-	-	66	5	6	1
	95	2	-	-	-	-	-	-	-	-	-	-	-	-	40	4	4	2
	00	7	-	-	-	-	-	-	-	-	-	-	-	-	140	6	13	7
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%			- 9%							
'95		00%			00%			00%			+57%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	66		-			
												'95	60		-			
												'00	140		-			
Pediocactus simpsonii																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
	00	-	-	-	2	-	-	-	-	-	-	-	-	-	40		2	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	10	-	-	-	-	-	-	-	-	-	-	-	-	200	2	3	10
	00	5	-	-	-	-	-	-	-	-	-	-	-	-	100	2	16	5
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	1	-	-	-	-	-	-	-	-	1	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%			-27%							
'00		00%			00%			13%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	0%			
												'88	0		0%			
												'95	220		0%			
												'00	160		13%			

A Y G R E	Y	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Purshia tridentata																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	1	2	3	-	-	-	-	-	-	6	-	-	-	120	20 78	6	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20	4 9	1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		33%			50%			00%			-83%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)														'82	0	Dec:	-	
														'88	0		-	
														'95	120		-	
														'00	20		-	
Tetradymia canescens																		
M	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66	17 8	1	
	88	-	2	-	-	-	-	-	-	-	2	-	-	-	133	13 18	2	
	95	4	-	-	1	-	-	-	-	-	5	-	-	-	100	10 13	5	
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80	-	4	
D	82	2	-	-	-	-	-	-	-	-	-	-	2	-	133		2	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			67%			-33%							
'88		100%			00%			00%			-10%							
'95		00%			00%			00%			-33%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)														'82	199	Dec:	67%	
														'88	133		0%	
														'95	120		17%	
														'00	80		0%	

Trend Study 8B-4-00

Study site name: Greendale .

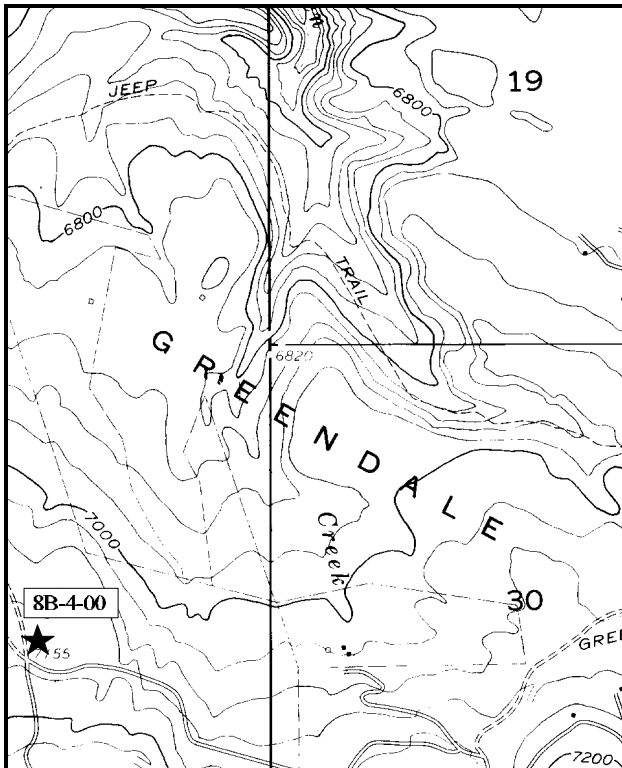
Range type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 347°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

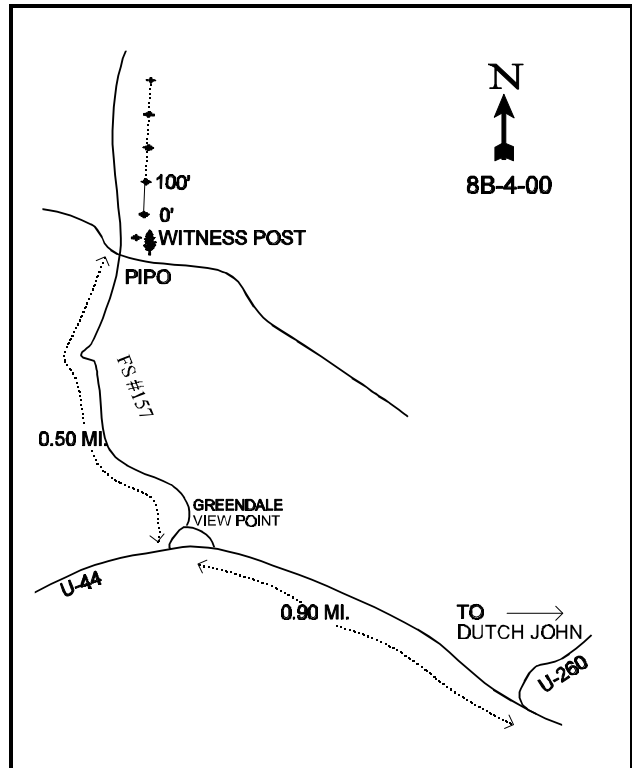
LOCATION DESCRIPTION

From the junction of Highways U-44 and U.S. 191, proceed towards Manilla for 0.9 miles. Turn off at the Greendale view point. Take the dirt road (FS 157) to the north which goes to the Canyon Rim trail. Go 0.5 miles to an intersection. From the Ponderosa pine northeast of the intersection, the 0-foot baseline stake is 21 paces away bearing 26°.



Map Name: Dutch John

Township 2N, Range 21E, Section 25



Diagrammatic Sketch

UTM 4526159.833 N, 626500.233 E

## DISCUSSION

### Trend Study No. 8B-4 (9-4)

The Greendale study samples a sagebrush/grass park surrounded by montane forest at 7,100 feet in elevation. The site is nearly level (0-5%) with a slight north aspect. The area is classified as deer and elk winter range, but depending on the weather, it actually receives year-round use by big game. Pellet group data from 2000 indicate moderate deer use at 28 deer days use/acre (69 ddu/ha). Elk use is moderately high at an estimated 62 days use/acre (153 edu/ha). This area is also used by rabbits and a few moose (see pellet group table). Cattle also graze the area at a level of 13.4 suitable acres per AUM from June 1<sup>st</sup> to September 30<sup>th</sup>. Livestock use is estimated at 10 cow days use/acre (25 cdu/ha) in 2000.

Soil on the site is fairly deep for a range site with gravel and rock uncommon on the surface and evenly dispersed throughout the profile. Effective rooting depth is estimated a nearly 20 inches. It has a sandy clay loam texture and is slightly acidic in reactivity (pH of 6.3). Phosphorus is limited at only 3.3 ppm. Values less than 10 ppm can limit normal plant growth and development. Erosion is minimal due to the level terrain and the abundance of vegetation and litter cover. Percent cover for bare ground has steadily declined from a high of 36% in 1982, to 12% in 2000.

The key browse species on the site are mountain big sagebrush and antelope bitterbrush. Sagebrush is more numerous and provides the majority of the browse cover. It had an estimated density of 1,733 plants/acre in 1982, increasing to 4,400 by 1988. The population has remained fairly stable since then and currently ('00) numbers 4,800 plants/acre. Use has varied from light to moderate. Percent decadency has been relatively low in the past (19% in 1982 to 6% in 1995), but increased to 29% in 2000 due to drought conditions. Approximately 20% (280 plants/acre) of the decadent plants sampled in 2000 appear to be dying. Young plants appear numerous enough to maintain the population however.

Bitterbrush contributed 15% of the total browse cover in 1995, increasing to 23% in 2000. Density is currently ('00) estimated at 1,380 plants/acre. Use was moderate to heavy in 1982 and 1988, but mostly moderate in 1995 and 2000. Percent decadence has remained low and vigor normal on most plants since 1982.

The low growing Fendler ceanothus is also abundant and contributed 25% of the total browse cover in 1995, and 15% in 2000. It is a short stature plant with an average height of only 8 or 9 inches, yet it has a crown of 3½ to 4 feet. It is capable of producing good quantities of forage in the winter if the snows are not deep. There appears to be little use on this shrub however. The increase in density for this species since 1982 is more reflective of the much larger sample used in 1995 and 2000 which gives better population estimates for species with discontinuous and/or clumped distributions.

Other browse growing on the site include: mountain low rabbitbrush, snakeweed, Oregon grape, Wood's rose and snowberry. These species show little or no utilization. Ponderosa pine surround the site and a few mature and young trees are scattered on the site. Point-center quarter data from 2000 estimate 21 trees/acre with an average diameter of 3.4 inches. Overhead canopy cover averages 2% directly on the site.

The herbaceous understory is diverse and abundant with grasses and forbs combining to produce 49% of the total vegetative cover in 1995 and 58% in 2000. The dominant grass by far is Kentucky bluegrass which currently ('00) provides 85% of the total grass cover. It forms a dense sod over much of the area which tends to exclude other native grass and forb species. The only other common grass species is needle-and-thread.

Forbs are diverse and produced as much cover as grasses in 1995, with 32 perennial and 4 annual species being encountered. Cover of forbs decreased in 2000 while that of grasses increased. Sum of nested frequency of

forbs and grasses both declined in 2000, due primarily to drought. The most numerous perennial forbs include: arrowleaf balsamroot, pussytoes and rock goldenrod. Two annual forbs, slenderleaf collomia and littleflower collinsia were abundant in 1995, but due to the dry conditions in 2000, they declined significantly.

#### 1982 APPARENT TREND ASSESSMENT

Soil trend appears stable with little evidence of extensive soil movement. The vegetative cover is irregular and somewhat unevenly spaced but quite dense where it occurs. Vegetative trend also appears stable, although open to more question. Shrub density could be better, especially among the more preferred species which show relatively heavy levels of use. Undesirable shrubs are not currently abundant and show few signs of rapid increase. Grasses and forbs are fairly dense and may inhibit, to some extent, shrub reproduction.

#### 1988 TREND ASSESSMENT

Vegetative and litter cover remain excellent, providing adequate ground cover, yet the data shows an increase in the proportion of pavement and rock cover. As a result, bare soil decreased from 36% to 25%. Aside from rather significant soil loss from the roads and a nearby large gully, soil erosion is not a problem on the well-vegetated study site. Trend for soil is slightly improved. The browse trend is also up for the preferred species, mountain big sagebrush and bitterbrush. Densities have increased, decadency rates are low, vigor is generally good and reproduction is excellent. Trend for the herbaceous understory is up with an increase in the quadrat frequency of grasses and forbs.

##### TREND ASSESSMENT

soil - slightly up (4)

browse - up (5)

herbaceous understory - up (5)

#### 1995 TREND ASSESSMENT

Ground cover characteristics continue to improve with percent bare ground declining from 25% to 17%. Litter cover has also increased slightly. Herbaceous plants make up 50% of the vegetation cover, further protecting the soil from erosion. The browse trend is improving for mountain big sagebrush due to increased density, good vigor, low percent decadency, and good recruitment. Trend for bitterbrush is slightly up due to reduced heavy use, good vigor, and a reduction in percent decadency. Overall, trend for browse is up. Trend for the herbaceous understory is also up due to a large increase in sum nested frequency for perennial grasses and forbs.

##### TREND ASSESSMENT

soil - up (5)

browse - up (5)

herbaceous understory - up (5)

#### 2000 TREND ASSESSMENT

Trend for soil is up. Percent cover of vegetation and litter have moderately increased while percent cover of bare ground continues to decrease. This has resulted in an improvement in the ratio of protective ground cover (vegetation, litter and cryptogams) to bare ground from 2.9:1 to 4.1:1. Herbaceous cover has also increased from 27% to 32% since 1995. There is no significant erosion occurring on the site. Trend for the key browse species, mountain big sagebrush and bitterbrush, are stable. Sagebrush shows only light to moderate use but percent decadence has increased from 6% to 29% due to drought. Vigor continues to be normal on most plants



and recruitment from young plants is currently good at 11%. Bitterbrush is moderately browsed, in good vigor, and has low decadency. Trend for the herbaceous understory is slightly down and still dominated by Kentucky bluegrass. Sum of nested frequency of perennial grasses and forbs have declined slightly. Kentucky bluegrass currently provides 85% of the grass cover and 66% of the herbaceous cover. It actually increased significantly in nested frequency and nearly doubled in cover. Nested frequency of thickspike wheatgrass, orchardgrass, prairie Junegrass, Sandberg bluegrass, and bottlebrush squirreltail declined significantly but they were never very abundant. Nested frequency of perennial forbs declined slightly while frequency of the annual forbs, slenderleaf collomia and littleflower collinsia, declined significantly due to the dry conditions.

#### TREND ASSESSMENT

soil - up (5)

browse - stable (3)

herbaceous understory - slightly down, still dominated by Kentucky bluegrass (2)

#### HERBACEOUS TRENDS --

Herd unit 08B, Study no: 4

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	<sub>a</sub> 37	<sub>b</sub> 110	<sub>a</sub> 19	-	21	37	10	.88	.12
G	Agropyron spicatum	-	4	3	-	-	2	1	.03	.00
G	Agropyron trachycaulum	-	-	4	4	-	-	2	-	.03
G	Bromus tectorum (a)	-	5	-	-	-	2	-	.15	-
G	Carex spp.	20	17	18	4	11	7	9	.08	.16
G	Dactylis glomerata	<sub>a</sub> -	<sub>b</sub> 25	<sub>a</sub> 4	-	-	10	2	.07	.18
G	Elymus junceus	-	-	-	1	-	-	-	-	-
G	Danthonia spicata	-	-	1	-	-	-	1	-	.00
G	Koeleria cristata	<sub>b</sub> 18	<sub>b</sub> 18	<sub>a</sub> 3	-	9	8	1	.11	.03
G	Poa fendleriana	<sub>a</sub> -	<sub>b</sub> 28	<sub>b</sub> 11	-	-	11	6	.25	.08
G	Poa pratensis	<sub>a</sub> 303	<sub>a</sub> 287	<sub>b</sub> 352	-	98	91	99	10.21	21.30
G	Poa secunda	<sub>a</sub> 8	<sub>b</sub> 33	<sub>a</sub> 11	44	5	13	4	.26	.04
G	Sitanion hystrix	<sub>b</sub> 54	<sub>b</sub> 40	<sub>a</sub> 3	21	27	17	1	.28	.00
G	Stipa comata	<sub>a</sub> 36	<sub>b</sub> 82	<sub>b</sub> 82	19	19	35	35	.97	3.17
G	Stipa lettermani	1	-	-	10	1	-	-	-	-
Total for Annual Grasses		0	5	0	0	0	2	0	0.15	0
Total for Perennial Grasses		477	644	511	98	191	231	171	13.18	25.17
Total for Grasses		477	649	511	98	191	233	171	13.33	25.17
F	Achillea millefolium	<sub>a</sub> -	<sub>a</sub> 1	<sub>b</sub> 11	-	-	1	3	.00	.09
F	Agoseris glauca	<sub>a</sub> -	<sub>b</sub> 27	<sub>a</sub> -	-	-	13	-	.09	-
F	Allium spp.	<sub>a</sub> -	<sub>b</sub> 46	<sub>a</sub> -	26	-	22	-	.18	-
F	Antennaria rosea	<sub>a</sub> 6	<sub>b</sub> 37	<sub>b</sub> 35	-	3	14	15	1.11	.92

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Arabis spp.	-	5	2	-	-	2	1	.01	.00
F	Artemisia ludoviciana	-	-	4	-	-	-	2	-	.18
F	Aster chilensis	<sub>a</sub> 4	<sub>b</sub> 24	<sub>b</sub> 17	1	2	8	10	.26	.32
F	Astragalus spp.	-	-	2	-	-	-	1	-	.00
F	Balsamorhiza sagittata	<sub>a</sub> 8	<sub>b</sub> 57	<sub>b</sub> 59	2	4	29	31	3.67	3.95
F	Calochortus nuttallii	<sub>a</sub> -	<sub>b</sub> 7	<sub>a</sub> -	2	-	3	-	.01	-
F	Castilleja spp.	-	1	-	-	-	1	-	.00	-
F	Collomia linearis (a)	-	<sub>b</sub> 195	<sub>a</sub> 3	-	-	71	1	1.56	.00
F	Comandra pallida	54	72	66	18	22	30	29	.39	.65
F	Collinsia parviflora (a)	-	<sub>b</sub> 255	<sub>a</sub> 3	-	-	81	2	2.95	.01
F	Cymopterus longipes	8	7	19	-	3	3	9	.01	.07
F	Eriogonum alatum	<sub>b</sub> 45	<sub>a</sub> 6	<sub>a</sub> 4	11	21	3	2	.07	.01
F	Erigeron divergens	28	-	-	-	12	-	-	-	-
F	Erigeron eatonii	<sub>a</sub> 12	<sub>a</sub> 11	<sub>b</sub> 28	2	5	5	14	.02	.45
F	Erigeron flagellaris	<sub>a</sub> -	<sub>a</sub> 3	<sub>b</sub> 36	-	-	1	14	.03	.93
F	Eriogonum umbellatum	6	6	4	4	3	2	2	.03	.15
F	Gayophytum ramosissimum (a)	-	2	-	-	-	1	-	.00	-
F	Gilia aggregata	-	-	-	3	-	-	-	-	-
F	Heterotheca villosa	<sub>b</sub> 110	<sub>a</sub> 39	<sub>a</sub> 17	45	46	17	9	.29	.46
F	Holosteum umbellatum (a)	-	-	1	-	-	-	1	-	.03
F	Ipomopsis aggregata	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 7	-	-	-	3	.00	.01
F	Lepidium spp. (a)	-	5	-	-	-	2	-	.01	-
F	Linum lewisii	40	35	35	20	19	16	16	.10	.24
F	Lithospermum ruderales	<sub>a</sub> -	<sub>a</sub> 2	<sub>b</sub> 12	-	-	1	6	.03	.10
F	Lomatium spp.	<sub>a</sub> -	<sub>b</sub> 6	<sub>a</sub> -	-	-	4	-	.02	-
F	Lupinus argenteus	1	-	-	-	1	-	-	-	-
F	Lychnis drummondii	-	-	-	3	-	-	-	-	-
F	Oenothera pallida	<sub>b</sub> 26	<sub>a</sub> 6	<sub>a</sub> -	-	11	2	-	.01	-
F	Penstemon humilis	<sub>a</sub> 2	<sub>b</sub> 18	<sub>ab</sub> 9	3	2	8	4	.14	.04
F	Petrorhiza pumila	40	27	23	19	19	14	10	.92	1.00
F	Phlox austromontana	<sub>a</sub> -	<sub>b</sub> 8	<sub>ab</sub> 3	-	-	5	1	.51	.00
F	Phlox longifolia	<sub>a</sub> -	<sub>b</sub> 7	<sub>b</sub> 6	-	-	3	3	.01	.04
F	Phlox spp.	<sub>a</sub> -	<sub>b</sub> 21	<sub>a</sub> -	-	-	7	-	.03	-
F	Polygonum douglasii (a)	-	<sub>b</sub> 51	<sub>a</sub> 14	-	-	24	7	.19	.03
F	Sedum lanceolatum	<sub>c</sub> 23	<sub>b</sub> 13	<sub>a</sub> -	-	11	5	-	.02	-
F	Solidago sparsiflora	17	27	10	-	8	14	6	.51	.24
F	Taraxacum officinale	<sub>a</sub> -	<sub>b</sub> 11	<sub>ab</sub> 6	-	-	5	2	.05	.01
F	Tragopogon dubius	5	8	5	1	2	5	3	.02	.04

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Trifolium gymnocarpon	a-	b10	b6	-	-	5	4	.03	.02
F	Zigadenus spp.	-	3	-	-	-	1	-	.00	-
Total for Annual Forbs		0	508	21	0	0	179	11	4.72	0.08
Total for Perennial Forbs		435	551	426	160	194	249	200	8.65	10.01
Total for Forbs		435	1059	447	160	194	428	211	13.38	10.09

Values with different subscript letters are significantly different at  $\alpha = 0.10$

#### BROWSE TRENDS --

Herd unit 08B, Study no: 4

T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Amelanchier alnifolia	0	1	-	.38
B	Artemisia tridentata vaseyana	84	90	14.17	13.44
B	Ceanothus fendleri	23	32	6.81	3.92
B	Chrysothamnus viscidiflorus lanceolatus	26	21	.71	.33
B	Gutierrezia sarothrae	3	1	.03	.15
B	Mahonia repens	10	13	.45	.16
B	Pinus ponderosa	0	2	-	1.23
B	Purshia tridentata	52	46	3.98	6.00
B	Rosa woodsii	2	0	-	-
B	Symphoricarpos oreophilus	4	2	.79	.21
Total for Browse		204	208	26.97	25.85

#### CANOPY COVER --

Herd unit 08B, Study no: 4

Species	Percent Cover	
	'95	'00
Pinus ponderosa	-	2

BASIC COVER --

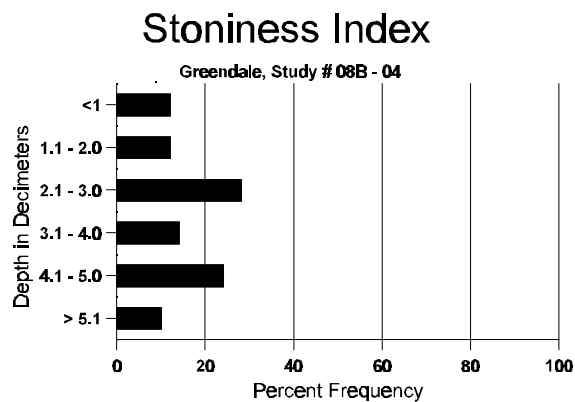
Herd unit 08B, Study no: 4

Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	384	364	9.25	10.75	46.69	59.22
Rock	144	84	2.25	4.00	2.57	1.79
Pavement	158	118	0	7.00	1.43	1.28
Litter	398	389	51.25	53.25	55.45	65.27
Cryptogams	33	40	1.25	0	.57	.75
Bare Ground	280	193	36.00	25.00	16.99	11.93

SOIL ANALYSIS DATA --

Herd Unit 8B, Study # 4, Study Name: Greendale

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
19.86	56.2 (18.11)	6.3	61.4	21.7	16.9	2.5	3.3	227.2	0.6



PELLET GROUP FREQUENCY --

Herd unit 08B, Study no: 4

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre 00	Days Use per Acre (ha) 00
Rabbit	-	11	348	N/A
Elk	2	6	800	62 (152)
Deer	8	35	366	28 (69)
Cattle	1	3	122	10 (25)
Moose	-	-	9	0.5 (1)

## BROWSE CHARACTERISTICS --

Herd unit 08B, Study no: 4

Area Unit 66B, Study No. 7																		
A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Amelanchier alnifolia																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	29	45	0
	00	1	-	-	-	-	-	-	-	-	-	1	-	-	20	26	35	1
% Plants Showing		<u>Moderate Use</u>				<u>Heavy Use</u>				<u>Poor Vigor</u>				<u>%Change</u>				
'82		00%				00%				00%								
'88		00%				00%				00%								
'95		00%				00%				00%								
'00		00%				00%				00%								
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	0		-			
												'00	20		-			
Artemisia tridentata vaseyana																		
S	82	2	-	-	-	-	-	-	-	-	-	2	-	-	133			2
	88	13	-	-	-	-	-	-	-	-	10	-	3	-	866			13
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	16	4	-	-	-	-	1	-	-	19	2	-	-	1400			21
	95	6	20	-	-	-	-	-	-	-	26	-	-	-	520			26
	00	25	1	-	-	-	-	-	-	-	26	-	-	-	520			26
M	82	21	-	-	-	-	-	-	-	-	17	4	-	-	1400	24	31	21
	88	15	17	2	1	1	-	-	-	-	36	-	-	-	2400	26	26	36
	95	50	105	25	-	3	-	-	-	-	183	-	-	-	3660	19	30	183
	00	82	51	-	4	1	4	2	-	-	144	-	-	-	2880	19	27	144
D	82	2	3	-	-	-	-	-	-	-	-	5	-	-	333			5
	88	5	3	1	-	-	-	-	-	-	9	-	-	-	600			9
	95	6	6	1	-	-	-	-	-	-	10	-	-	3	260			13
	00	29	30	-	8	1	-	2	-	-	56	-	-	14	1400			70
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	220			11
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	400			20
% Plants Showing		<u>Moderate Use</u>				<u>Heavy Use</u>				<u>Poor Vigor</u>				<u>%Change</u>				
'82		12%				00%				00%				+61%				
'88		38%				05%				00%				+ 1%				
'95		60%				12%				01%				+ 8%				
'00		35%				02%				06%								
Total Plants/Acre (excluding Dead & Seedlings)												'82	1733	Dec:	19%			
												'88	4400		14%			
												'95	4440		6%			
												'00	4800		29%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Ceanothus fendleri																		
Y	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	39	-	-	-	-	-	-	-	-	39	-	-	-	780	9	39	
	00	39	-	-	2	-	-	-	-	-	41	-	-	-	820	8	41	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%			+13%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	66	Dec:	-			
												'88	0		-			
												'95	780		-			
												'00	900		-			
Chrysothamnus viscidiflorus lanceolatus																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	82	6	-	-	-	-	-	-	-	-	6	-	-	-	400	10	6	
	88	6	-	-	-	-	-	1	-	-	6	1	-	-	466	12	7	
	95	30	1	-	9	-	-	-	-	-	40	-	-	-	800	14	40	
	00	28	-	-	1	-	-	-	-	-	29	-	-	-	580	10	29	
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	1	-	-	1	-	-	-	20		1	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			+14%							
'88		00%			00%			00%			+45%							
'95		02%			00%			00%			-26%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	400	Dec:	0%			
												'88	466		0%			
												'95	840		0%			
												'00	620		3%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Gutierrezia sarothrae																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	88	1	-	-	-	-	-	-	-	-	1	-	-	66	6	10	1	
	95	4	-	-	-	-	-	-	-	-	4	-	-	80	7	7	4	
	00	2	-	-	-	-	-	-	-	-	2	-	-	40	-	-	2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%			+18%							
'95		00%			00%			00%			-50%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	66		-			
												'95	80		-			
												'00	40		-			
Mahonia repens																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	00	71	-	-	-	-	-	-	-	-	71	-	-	1420			71	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	95	244	-	-	-	-	-	-	-	-	244	-	-	4880	3	4	244	
	00	16	-	-	-	-	-	-	-	-	16	-	-	320	2	2	16	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>% Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%			-64%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	4880		-			
												'00	1740		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Pinus ponderosa																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	-	1	-	-	-	20		1
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	2	-	-	-	-	-	-	-	-	-	2	-	-	-	40	-	-
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	0		-			
												'00	60		-			
Purshia tridentata																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	1	-	-	2	-	-	-	40		2	
	00	-	-	-	-	-	-	1	-	-	1	-	-	-	20		1	
Y	82	-	1	-	-	-	-	-	-	-	-	1	-	-	66		1	
	88	4	-	-	-	2	-	1	-	-	6	1	-	-	466		7	
	95	1	4	-	-	-	-	-	-	-	5	-	-	-	100		5	
	00	4	-	-	1	-	-	1	-	-	6	-	-	-	120		6	
M	82	-	17	3	-	-	-	-	-	-	8	12	-	-	1333	22	26	20
	88	3	8	8	-	1	-	2	-	-	18	-	4	-	1466	19	25	22
	95	4	35	5	2	11	-	-	-	-	57	-	-	-	1140	14	33	57
	00	20	21	-	4	10	1	-	-	-	56	-	-	-	1120	17	35	56
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	3	1	-	-	-	-	-	-	4	-	-	-	266		4	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	4	-	2	-	-	-	-	-	5	-	-	2	140		7	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		86%			14%			00%			+36%							
'88		42%			27%			12%			-44%							
'95		81%			08%			00%			+10%							
'00		51%			01%			03%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	1399	Dec:	0%			
												'88	2198		12%			
												'95	1240		0%			
												'00	1380		10%			



A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Rosa woodsii																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	8	-	-	-	-	-	-	-	-	-	-	-	-	160		8	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	1	-	-	-	-	-	-	-	-	-	-	-	-	20	7	1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	180		-			
												'00	0		-			
Symphoricarpos oreophilus																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
M	82	1	-	-	-	-	-	-	-	-	-	-	-	-	66	9	17	
	88	1	-	-	-	-	-	-	-	-	-	-	-	-	66	10	19	
	95	5	-	-	-	-	-	-	-	-	-	-	-	-	100	17	53	
	00	1	-	-	-	-	-	-	-	-	-	-	-	-	20	20	66	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			+ 0%							
'88		00%			00%			00%			+34%							
'95		00%			00%			00%			-60%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	66	Dec:	-			
												'88	66		-			
												'95	100		-			
												'00	40		-			

## Trend Study 8B-5-00

Study site name: Bennett Ranch.

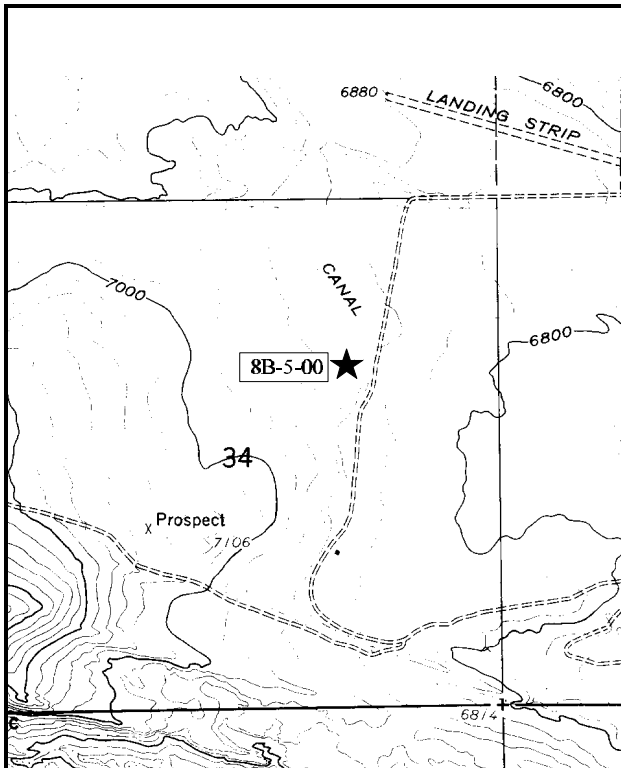
Range type: Big Sagebrush-Grass.

Compass bearing: frequency baseline 200°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

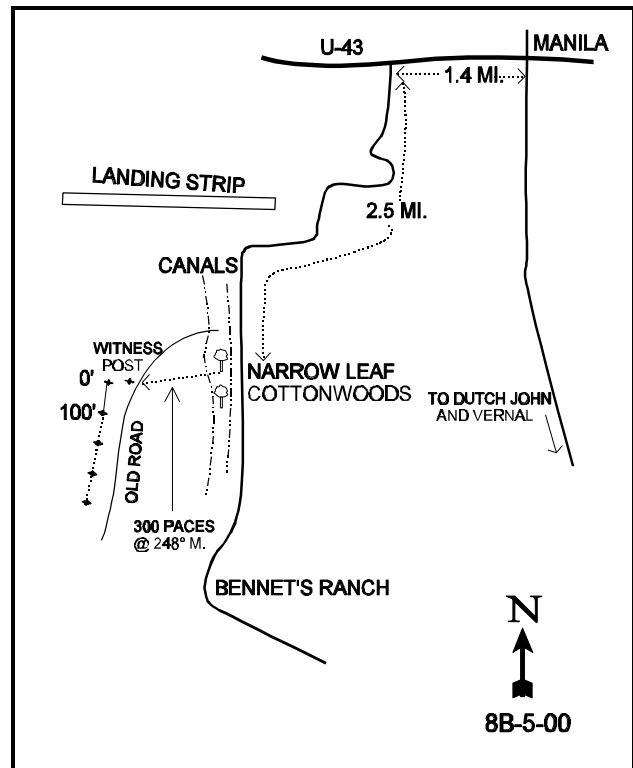
### LOCATION DESCRIPTION

From the intersection of Highway U-43 and Main Street in Manila, proceed west on U-43 for 1.4 miles to a dirt road (Bennion Lane) on the left. Turn south and go 2.5 miles to a narrowleaf cottonwood on the right (west) side of the road. From the cottonwood, the 0-foot baseline stake is 300 paces away at a bearing of 234°M.



Map Name: Jessen Butte

Township 3N, Range 19E, Section 34



Diagrammatic Sketch

UTM 4534184 N, 603794 E

## DISCUSSION

### Trend Study No. 8B-5 (9-5)

The Bennett Ranch trend study is located on Bennett Ranch property which is privately owned. It samples a Wyoming big sagebrush community, located at the foot of Jensen Butte and above the irrigated hay fields and pastures near Manila. Slope is 5% to 10% with a northeast facing aspect and an elevation of approximately 6,920 feet. The area is used by cattle and wintering deer and elk. Pellet group data from 2000 estimate 14 elk, 9 deer, and 6 cow days use/acre (35 edu/ha, 22 ddu/ha and 15 cdu/ha). Deer and cattle use appears to have been much heavier in 1995, due to the substantially higher quadrat frequencies of pellet groups (see pellet group table).

Soils are relatively shallow, alluvially deposited, and rocky on the surface and throughout the profile. Rooting depth is restricted in some areas as evidenced by the abundance of black sagebrush. Effective rooting depth is estimated at a little less than 9 inches. Soil texture is a sandy clay loam with a neutral pH. Phosphorus is limited at only 6 ppm, where values less than 10 ppm can limit normal plant growth and development. Ground cover is typical for a Wyoming big sagebrush site with a moderately high percentage of bare ground. Some erosion is occurring on the site but it is not serious due to the lack of slope.

The key browse includes Wyoming big sagebrush and black sagebrush which provide over 80% of the browse cover. Wyoming big sagebrush currently provides 68% of the shrub cover with a density estimated at 5,260 plants/acre in 2000. These shrubs have been heavily utilized in the past with 88% of the plants sampled being heavily hedged (>60% of stems browsed) in 1982. Vigor was also poor on 29% of the population. Use was more moderate in 1988 and 1995 with improved vigor. Use is currently ('00) moderate to heavy. However, due to the dry conditions, 21% of the population was classified as having poor vigor. Percent decadence has increased from 7% in 1995 to 39% in 2000. In addition, 54% of the decadent plants sampled were classified as dying. No seedlings were encountered in 2000, with young plants only accounting for 2% of the population. As a result, the population of Wyoming big sagebrush appears to be in a state of decline. Due to the limited effective rooting depth of the soil, this is a marginal site for Wyoming big sagebrush with this high of a density during drought years. Sagebrush sampled during the very dry summer of 2000 produced very small leaves with few seed heads. Many of the plants were dropping leaves to conserve water.

Black sagebrush appears to have a more stable population of 4,060 plants/acre in 2000. They are relatively small plants, measuring only 6 inches in height with a crown diameter averaging 15 inches. Use has been light to moderate since 1982 with normal vigor on most plants. Other preferred browse encountered on the site include small numbers of winterfat, white rubber rabbitbrush and slenderbush eriogonum.

Grasses and forbs are quite diverse for a Wyoming big sagebrush site. Grasses combine to produce about 8% average cover, while forbs on average make up about 5% cover. Dominant grasses include: thickspike wheatgrass, muttongrass, Sandberg bluegrass, bottlebrush squirreltail and needle-and-thread grass. The only abundant forbs include Hood's phlox and scarlet globemallow. Utilization of the grasses has been heavy in the past but there was no apparent use observed in 2000.

### 1982 APPARENT TREND ASSESSMENT

Soil trend appears stable to declining. It is fortunate that this site occurs on nearly level terrain, otherwise erosion and soil loss would be much greater. Vegetative condition is rather poor due to heavy browsing. Trend is difficult to judge but it is considered slightly downward at this time. The herbaceous understory is obviously depleted but it is not immediately apparent if the shrub density is also declining.

## 1988 TREND ASSESSMENT

An increase in most ground cover components was noted in 1988. The percentage of bare soil decreased from 34% in 1982 to 23.5%. There is some soil movement in the bare interspaces. A healthier herbaceous understory would do much to help limit erosion on the gentle slope. Trend for soil is slightly up. Trend for black sagebrush and Wyoming big sagebrush is up with increased densities, reduced heavy use, and improved vigor. Trend for the herbaceous understory is also up slightly due to increased quadrat frequency of grasses and forbs.

### TREND ASSESSMENT

soil - slightly up (4)

browse - up (5)

herbaceous understory - slightly up (4)

## 1995 TREND ASSESSMENT

Percent litter cover has declined slightly as has percent bare ground. The soil trend is considered stable at this time. Trend for Wyoming big sagebrush is slightly up due to decreased heavy use, improved vigor, good recruitment, and a low decadency rate of only 7%. The population density has declined since 1988 but this decline came mostly from the decadent age class. The number of mature plants has increased. Black sagebrush is of secondary importance on this site. It displays a stable trend but produces little forage due to its small size. The herbaceous understory has a slightly downward trend. Sum of nested frequency of perennial grasses and forbs declined slightly.

### TREND ASSESSMENT

soil - stable (3)

browse - slightly up (4)

herbaceous understory - slightly down (2)

## 2000 TREND ASSESSMENT

Trend for soil continues to be stable. Percent cover of bare ground increased slightly while cover from litter declined slightly. However, percent cover of vegetation has increased and the ratio of protective ground cover (vegetation, litter and cryptogams) to bare ground has improved. Trend for the key browse species, Wyoming big sagebrush, is down. Density has declined and poor vigor and percent decadence have increased. In addition, over half of the 2,060 decadent plants sampled were classified as dying. Reproduction is poor with no seedlings sampled and young plants account for only 2% of the population. It appears that the restricted rooting depth of the shallow soil makes this a marginal site for Wyoming big sagebrush at these densities during dry years. In contrast, black sagebrush, which is adapted to more shallow soils, has a stable trend. It displays light to moderate use, good vigor and low decadence. Since Wyoming big sagebrush provides 68% of the browse cover and the majority of the available forage (with winter snow cover), the browse trend is considered slightly down at this time. Trend for the herbaceous understory is stable. Sum of nested frequency for perennial grasses and forbs declined slightly but not enough to warrant a downward trend. The most dominant grasses, thickspike wheatgrass, mutton bluegrass and needle-and-thread, did not change significantly in nested frequency.

### TREND ASSESSMENT

soil - stable (3)

browse - slightly down (2)

herbaceous understory - stable (3)

HERBACEOUS TRENDS --  
Herd unit 08B, Study no: 5

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron cristatum	1	-	-	-	1	-	-	-	-
G	Agropyron dasystachyum	a209	ab220	b247	14	77	79	82	2.75	3.98
G	Agropyron intermedium	-	-	3	-	-	-	1	-	.03
G	Hilaria jamesii	-	-	3	-	-	-	1	-	.00
G	Koeleria cristata	b47	a19	a7	1	18	8	4	.11	.07
G	Oryzopsis hymenoides	a24	b35	a14	29	10	21	8	.43	.19
G	Poa fendleriana	b177	a47	a81	45	67	21	32	.88	1.50
G	Poa secunda	a68	b71	a61	-	30	31	28	.74	.46
G	Sitanion hystrix	40	81	17	13	19	32	8	1.36	.38
G	Stipa comata	b111	ab104	a87	55	59	48	32	1.99	1.93
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		677	577	520	157	281	240	196	8.27	8.57
Total for Grasses		677	577	520	157	281	240	196	8.27	8.57
F	Agoseris glauca	a-	a-	b12	-	-	-	5	-	.02
F	Arabis spp.	b4	b16	a-	-	3	6	-	.03	-
F	Astragalus spp.	3	-	1	2	2	-	1	-	.00
F	Calochortus nuttallii	b7	b6	a-	-	3	3	-	.01	-
F	Castilleja spp.	a-	a-	b4	-	-	-	3	-	.04
F	Chaenactis douglasii	a-	a1	b17	-	-	1	8	.00	.09
F	Chenopodium leptophyllum (a)	-	b47	a-	2	-	20	-	.10	-
F	Cirsium spp.	-	-	3	-	-	-	1	-	.00
F	Crepis acuminata	b16	b12	a1	-	11	8	1	.04	.00
F	Descurainia pinnata (a)	ab13	b32	a2	-	9	17	1	.16	.00
F	Erigeron spp.	a-	b4	b3	7	-	4	3	.02	.01
F	Haplopappus acaulis	-	-	3	-	-	-	1	-	.03
F	Hymenoxys richardsonii	b17	a1	ab7	5	8	1	3	.03	.09
F	Lesquerella alpina	-	4	2	-	-	2	1	.03	.00
F	Leucelene ericoides	ab23	a5	b31	-	10	3	17	.04	.38
F	Linum lewisii	ab37	b62	a26	3	21	29	15	.21	.13
F	Machaeranthera canescens	1	3	8	-	1	2	4	.18	.09
F	Penstemon humilis	b7	a-	a1	-	4	-	1	-	.03
F	Physaria acutifolia	-	-	1	-	-	-	1	-	.00
F	Phlox hoodii	b146	a94	ab124	42	63	45	56	2.59	2.97
F	Senecio multilobatus	-	-	4	-	-	-	2	-	.03
F	Sphaeralcea coccinea	a80	b119	ab98	38	38	50	44	1.36	1.22
F	Townsendia incana	b7	a-	a-	-	3	-	-	-	-

T y p e	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Unknown forb-perennial	<sub>b</sub> 8	<sub>a</sub> -	<sub>a</sub> -	-	3	-	-	-	-
Total for Annual Forbs		13	79	2	0	9	37	1	0.26	0.00
Total for Perennial Forbs		356	327	346	27	170	154	167	4.57	5.19
Total for Forbs		369	406	348	27	179	191	168	4.84	5.19

Values with different subscript letters are significantly different at  $\alpha = 0.10$

#### BROWSE TRENDS --

Herd unit 08B, Study no: 5

T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia nova	46	51	5.64	4.62
B	Artemisia tridentata wyomingensis	97	94	16.11	16.09
B	Ceratoides lanata	8	7	.60	.04
B	Chrysothamnus nauseosus hololeucus	1	0	.15	-
B	Chrysothamnus viscidiflorus viscidiflorus	9	19	.33	.39
B	Eriogonum microthecum	3	4	.03	.01
B	Gutierrezia sarothrae	25	61	.04	1.34
B	Juniperus osteosperma	-	-	.93	-
B	Opuntia spp.	30	41	1.58	1.11
B	Pinus edulis	0	0	-	.00
Total for Browse		219	277	25.44	23.62

#### BASIC COVER --

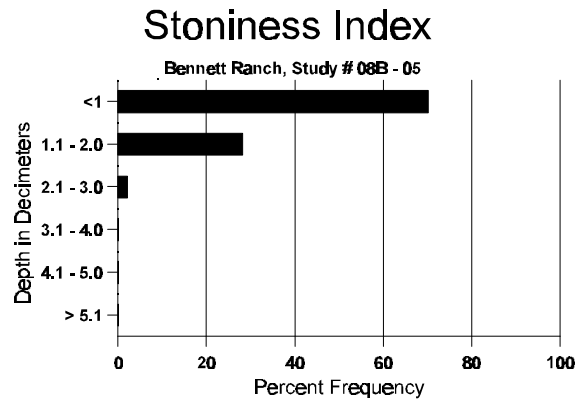
Herd unit 08B, Study no: 5

Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	334	339	3.00	6.75	32.09	41.79
Rock	239	129	5.50	9.00	9.55	5.67
Pavement	256	285	11.50	14.25	5.40	8.54
Litter	390	366	45.25	41.25	39.65	36.47
Cryptogams	96	194	.75	5.25	3.51	6.07
Bare Ground	319	315	34.00	23.50	21.24	29.50

# SOIL ANALYSIS DATA --

Herd Unit 8B, Study # 5, Study Name: Bennett Ranch

Effective rooting depth (inches)	Temp °F (depth)	pH	% sand	% silt	% clay	% OM	PPM P	PPM K	dS/m
8.83	73.6 (10.16)	7.1	61.4	16.0	22.6	2.1	6.0	92.8	0.9



# PELLET GROUP FREQUENCY --

Herd unit 08B, Study no: 5

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre 00	Days Use per Acre (ha) 00
Rabbit	3	2	70	N/A
Elk	10	9	183	14 (35)
Deer	32	7	122	9 (23)
Cattle	10	3	70	6 (14)

## BROWSE CHARACTERISTICS --

Herd unit 08B, Study no: 5

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia frigida																		
Y	'82	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	'88	1	-	-	-	-	-	-	-	-	1	-	-	66			1	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	'88	-	1	1	-	-	-	5	-	-	7	-	-	466	5	0	7	
	'95	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	'00	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
		'82 00%			00%			00%										
		'88 13%			13%			00%										
		'95 00%			00%			00%										
		'00 00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	532		-			
												'95	0		-			
												'00	0		-			



A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches)		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4		Ht.	Cr.	
Artemisia nova																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	11	-	-	1	-	-	-	-	-	11	1	-	-	800		12	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
Y	82	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2	
	88	12	3	1	-	-	-	-	-	-	16	-	-	-	1066		16	
	95	18	8	-	-	-	-	-	-	-	26	-	-	-	520		26	
	00	13	-	-	-	-	-	-	-	-	13	-	-	-	260		13	
M	82	25	2	-	-	-	-	-	-	-	27	-	-	-	1800	6 12	27	
	88	14	26	8	-	-	-	-	-	-	48	-	-	-	3200	7 14	48	
	95	77	29	5	-	-	-	-	-	-	111	-	-	-	2220	7 20	111	
	00	139	22	8	5	-	-	-	-	-	174	-	-	-	3480	6 15	174	
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	10	7	1	-	-	-	-	-	-	14	-	2	2	1200		18	
	95	-	-	-	1	-	-	-	-	-	-	-	-	1	20		1	
	00	15	1	-	-	-	-	-	-	-	9	-	-	7	320		16	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
		'82			07%			00%			+65%							
		'88			44%			12%			-50%							
		'95			27%			04%			+32%							
		'00			11%			04%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	1933	Dec:	0%			
												'88	5466		22%			
												'95	2760		1%			
												'00	4060		8%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia tridentata wyomingensis																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	10	-	-	-	-	-	-	-	-	-	-	-	-	666		10	
	95	2	-	-	-	-	-	-	-	-	-	-	-	-	40		2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66			
	88	11	3	-	-	-	-	-	-	-	14	-	-	-	933		14	
	95	17	11	3	-	-	-	-	-	-	31	-	-	-	620		31	
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
M	82	3	3	47	-	-	-	-	-	-	41	-	12	-	3533	11 17	53	
	88	2	31	24	-	-	-	-	-	-	51	1	4	1	3800	13 16	57	
	95	41	149	59	-	2	-	-	-	-	243	4	4	-	5020	14 27	251	
	00	42	54	32	-	6	22	-	-	-	149	7	-	-	3120	12 25	156	
D	82	-	-	5	-	-	-	-	-	-	-	-	1	4	333		5	
	88	15	12	9	-	-	-	-	-	-	21	2	4	9	2400		36	
	95	-	7	14	1	-	-	-	-	-	15	-	-	7	440		22	
	00	32	55	10	-	-	6	-	-	-	45	2	-	56	2060		103	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	280		14	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	200		10	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		05%			88%			29%			+45%							
'88		43%			31%			17%			-15%							
'95		56%			25%			04%			-13%							
'00		44%			27%			21%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	3932	Dec:	8%			
												'88	7133		34%			
												'95	6080		7%			
												'00	5260		39%			
Ceratoides lanata																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	1	-	-	-	-	-	1	-	-	-	20		1	
	00	1	3	-	-	-	-	-	-	-	4	-	-	-	80		4	
M	82	4	-	-	-	-	-	-	-	-	4	-	-	-	266	4 6	4	
	88	-	2	4	-	1	-	-	-	-	7	-	-	-	466	4 5	7	
	95	2	6	1	-	1	-	-	-	-	10	-	-	-	200	5 8	10	
	00	3	1	-	-	-	-	-	-	-	4	-	-	-	80	4 6	4	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			+43%							
'88		43%			57%			00%			-53%							
'95		64%			09%			00%			-27%							
'00		50%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	266	Dec:	-			
												'88	466		-			
												'95	220		-			
												'00	160		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Chrysothamnus nauseosus hololeucus																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	1	-	-	-	-	-	-	-	-	-	1	-	-	20	17	13	1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	20		-			
												'00	0		-			
Chrysothamnus viscidiflorus viscidiflorus																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	2	-	-	-	-	-	-	-	-	-	2	-	-	40			2
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	10	2	-	-	-	-	-	-	-	-	12	-	-	240	9	14	12
	00	20	-	-	-	-	-	-	-	-	-	20	-	-	400	9	15	20
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	2	1	-	-	-	-	-	-	-	-	1	-	-	60			3
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		17%			00%			00%			+52%							
'00		04%			00%			08%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	0%			
												'88	0		0%			
												'95	240		0%			
												'00	500		12%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total	
		1	2	3	4	5	6	7	8	9	1	2	3	4					
Eriogonum microthecum																			
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0		
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0		
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0		
	00	1	-	-	-	-	-	-	-	-	-	1	-	-	-	20	1		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	95	7	-	-	-	-	-	-	-	-	-	7	-	-	-	140	4	7	7
	00	3	-	-	-	-	-	-	-	-	-	3	-	-	-	60	4	7	3
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>								
'82		00%			00%			00%											
'88		00%			00%			00%											
'95		00%			00%			00%			-43%								
'00		00%			00%			00%											
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-				
												'88	0		-				
												'95	140		-				
												'00	80		-				
Gutierrezia sarothrae																			
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0		
	88	1	-	-	-	-	-	-	-	-	-	1	-	-	-	66	1		
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0		
	00	1	-	-	-	-	-	-	-	-	-	1	-	-	-	20	1		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0		
	88	51	-	-	2	-	-	-	-	-	-	53	-	-	-	3533	53		
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0		
	00	4	-	-	-	-	-	-	-	-	-	4	-	-	-	80	4		
M	82	47	-	-	-	-	-	-	-	-	-	47	-	-	-	3133	5	5	47
	88	62	-	-	1	-	-	1	-	-	-	64	-	-	-	4266	5	4	64
	95	32	-	-	2	-	-	-	-	-	-	34	-	-	-	680	12	14	34
	00	157	-	-	2	-	-	-	-	-	-	159	-	-	-	3180	5	7	159
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0		
	88	1	-	-	-	-	-	-	-	-	-	-	-	-	1	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0		
	00	2	-	-	-	-	-	-	-	-	-	1	-	-	-	1	40		2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>								
'82		00%			00%			00%			+60%								
'88		00%			00%			.84%			-91%								
'95		00%			00%			00%			+79%								
'00		00%			00%			.60%											
Total Plants/Acre (excluding Dead & Seedlings)												'82	3133	Dec:	0%				
												'88	7865		1%				
												'95	680		0%				
												'00	3300		1%				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Opuntia spp.																	
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	1	-	-	-	-	-	-	-	-	-	-	-	-	66		1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	1	-	-	-	-	-	-	-	-	-	-	-	-	20		1
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	8	-	-	2	-	-	-	-	-	-	-	1	-	666		10
	95	1	-	-	-	-	-	-	-	-	-	-	-	-	20		1
	00	3	-	-	1	-	-	-	-	-	-	-	-	-	80		4
M	82	15	-	-	-	-	-	-	-	-	-	-	-	-	1000	4 6	15
	88	19	-	-	1	-	-	-	-	-	-	-	1	-	1333	3 5	20
	95	37	4	-	1	-	-	-	-	-	-	-	-	-	840	4 15	42
	00	61	-	-	-	-	-	-	-	-	-	-	-	-	1220	4 11	61
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	2	-	-	-	-	-	-	-	-	-	-	1	1	133		2
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	1	-	-	-	-	-	-	-	-	-	-	-	-	20		1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'82		00%			00%			00%			+53%						
'88		00%			00%			13%			-60%						
'95		09%			00%			00%			+35%						
'00		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)												'82	1000	Dec:	0%		
												'88	2132		6%		
												'95	860		0%		
												'00	1320		2%		
Pinus edulis																	
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	1	-	-	-	-	-	-	-	-	-	-	-	-	20		1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'82		00%			00%			00%									
'88		00%			00%			00%									
'95		00%			00%			00%									
'00		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-		
												'88	0		-		
												'95	0		-		
												'00	0		-		

## Trend Study 8B-6-00

Study site name: Death Valley.

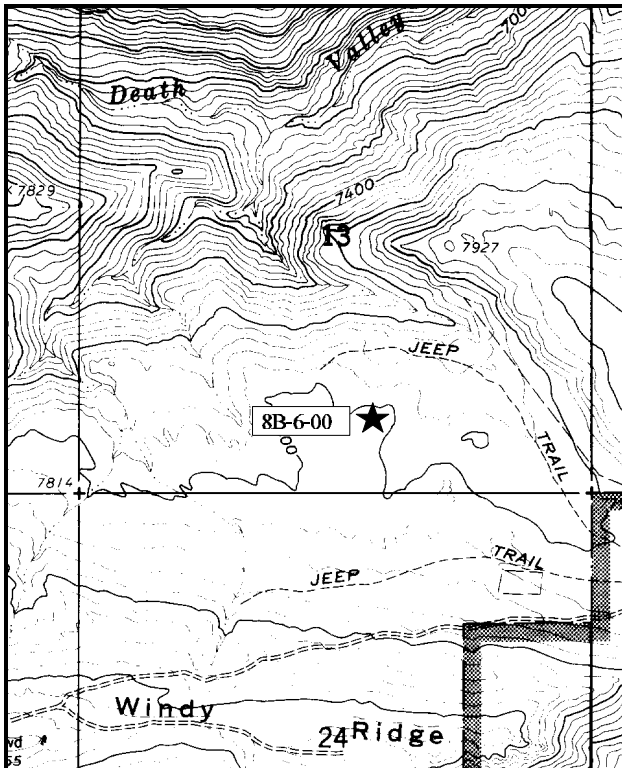
Range type: Mixed Mountain Brush.

Compass bearing: frequency baseline 15°M.

First frame placement on frequency belts 5 Feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

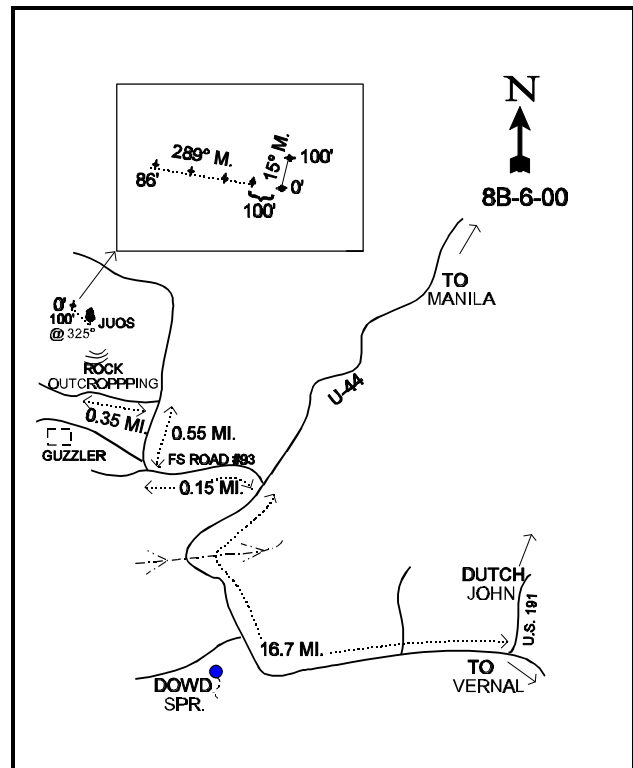
### LOCATION DESCRIPTION

From the Dutch John turnoff on Highway U-44, proceed 16.7 miles towards Manila. As you reach the summit before dropping down into Sheep Creek, there will be a dirt road to the left. Turn left on FS road #93 and drive west for 0.75 miles until you pass a grove of ponderosa pines. Turn to the right. The road forks again almost immediately, keep to the right and proceed 0.55 miles to another faint fork. Turn left and drive west 0.35 miles to the top of a small knoll. To the north, two rock outcroppings mark the highest point of the knoll. From the juniper on top, the 0-foot baseline stake is 100 feet away at a bearing of 325 °M.



Map Name: Manila

Township 2N, Range 19E, Section 13



Diagrammatic Sketch

UTM 4528499.648 N, 606945.431 E

## DISCUSSION

### Trend Study No. 8B-6 (9-6)

This trend study is located on critical deer and elk winter range in Death Valley. It samples a sagebrush-mixed mountain brush range type at an elevation of 7,800 feet. Death Valley is a broad bench that drops off very rapidly towards Death Valley Creek to the north. The site slope is gentle (3%-5%) with a slight west aspect. Deer and elk use the area heavily in the winter. Pellet group data from 2000 estimate 58 deer and 48 elk use days/acre (143 ddu/ha and 119 edu/ha). Most of the pellet groups encountered appeared to be from winter use. A few cow pats from last season were encountered along with one moose pellet group.

Soils are sandy and shallow with some rock outcrops in the area. Effective rooting depth is estimated at nearly 10 inches. Soil texture is a loamy sand with a neutral pH. Phosphorus is limited at only 2.5 ppm. Values less than 10 ppm can limit normal plant growth and development. Erosion is not a problem due to the lack of slope, abundant well dispersed vegetation, and litter cover.

The most important aspect of this site is the browse composition. Eleven species of shrubs were identified during the 1995 reading and 12 in 2000. The key species are true mountain mahogany and mountain big sagebrush. Mahogany provided 59% of the total browse cover in 1995 and 55% in 2000. Mountain big sagebrush accounted for 20% of the total browse cover in 1995, increasing to 31% in 2000. Mahogany density declined from 933 plants/acre in 1982 to 533 by 1988. No decadent plants were encountered either year and vigor was good. Shrubs displaying heavy use increased from zero in 1982 to 13% in 1988. With the new, larger sample used in 1995, estimated mahogany density was 1,680 plants/acre. Vigor was generally good and percent decadence was low at 2%, even though heavy use had increased to 35%. Density is currently ('00) estimated at 1,060 plants/acre. Use is moderate to heavy and percent decadence has increased to 23%. Half of the decadent plants sampled (120 plants/acre) were classified as dying. At this time there are no dead plants in the population. Currently ('00), reproduction in the form of seedling and young plants is poor.

Mountain big sagebrush has a fairly stable population of about 2,200 plants/acre. Most plants have been classified with light use in 1988, 1995, and 2000. The majority of the time (3 of the 4 sampling periods), more of the utilization has been classified as moderate rather than heavy. The exception was in 1995. Vigor has been normal on most plants over the years, although percent decadence was moderately high in 1982 and 1988 before a decline in 1995, down to 18%. Currently ('00) percent decadence is 37% with poor vigor displayed by 19% of the population. In addition, 46% of the decadent plants sampled were classified as dying (380 plants/acre). No seedlings have been encountered on the site since 1988. The average number of young plants for each sampling period is almost 17%, while the average percent of the population that is dead is 17%. These data would indicate that this population is just barely maintaining their numbers. If drought conditions continue, this population would probably decline in numbers. However, a return to normal precipitation patterns could reverse this trend.

Other important browse include a few large serviceberry, black sagebrush, and antelope bitterbrush. Some fringed sage, rabbitbrush, Oregon grape, snowberry and gray horsebrush were also sampled in low numbers.

The herbaceous understory is abundant and diverse. Grasses are dominated by alpine fescue and Sandberg bluegrass which combined to produce 67% of the grass cover in 1995, increasing to 84% in 2000. Thickspike wheatgrass is also fairly common. Forbs are very diverse, but only a few species produce more than 1% cover.

### 1982 APPARENT TREND ASSESSMENT

This is one of the better winter range sites on the unit. Overall range condition appears good and trend appears

stable. From a trend monitoring point of view, one of the more important items will be to keep track of the key species, especially reproduction. The field observers saw few established seedlings or young plants but also no decadent plants. A fairly large number of seedlings-of-the-year were observed but were not sampled.

#### 1988 TREND ASSESSMENT

Trend for soil is up. Increases in the measured percentages of vegetative and cryptogamic ground cover led to a significant decrease in the amount of bare soil. Percent bare ground has decreased from 29% in 1982 to 14% in 1988. The browse trend is mixed. Trend for one of the key species, mountain mahogany, is slightly down due to a slight decrease in population density. Trend for the other key species, mountain big sagebrush, is up due to a 54% increase in the population, excellent reproductive potential and a slight decrease in percent decadency. Overall, browse trend is up. Trend for the herbaceous understory is also up due to a dramatic increase in the quadrat frequency of grasses and forbs.

##### TREND ASSESSMENT

soil - up (5)

browse - up (5)

herbaceous understory - up (5)

#### 1995 TREND ASSESSMENT

The soil trend is stable. The browse trend is mixed. Trend for mountain big sagebrush is slightly down, but it only contributes 20% of the total browse cover. The density of mature plants is stable, yet 32% of the decadent plants were classified as dying. This condition appears to be caused by heavy use, as 41% of the mature and decadent plants display heavy hedging (>60% of twigs browsed). Continued heavy use combined with prolonged drought will cause a downward trend in sagebrush. Another downward indicator for the population is the ratio of dead to live plants which is quite high at 1:9. True mountain mahogany shows a slightly upward trend. Population density increased, but much of this difference would mostly be due to the greatly increased sample size used in 1995. Vigor is generally good and percent decadence is low at 2%. Heavy use has continually increased since 1982. Currently, 35% of the population displays heavy hedging. However, this is not excessive. According to Shepherd (1971), shrubs from the Rosaceae family like serviceberry, bitterbrush, and mountain mahogany, can withstand heavy use for many years without causing reduced vigor. Overall, trend for browse is stable. The herbaceous understory trend is stable. Sum of nested frequency for grasses declined slightly while frequency of perennial forbs increased slightly. Nested frequency of alpine fescue which accounts for 45% of the grass cover increased significantly. Other dominant grasses are thickspike wheatgrass and Sandberg bluegrass which declined significantly in nested frequency.

##### TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - stable (3)

#### 2000 TREND ASSESSMENT

Trend for soil is fairly stable. Percent cover of bare ground increased slightly, while litter cover declined. However, vegetative cover increased and perennial grass cover increased three-fold from 6% to 19%. Erosion is minimal due to the abundant and well dispersed protective ground cover combined with the gentle terrain. Trend for the key browse species, true mountain mahogany, is down slightly. Use is similar to 1995 estimates, but density has declined, percent decadence has increased from 2% to 23% and half of the decadent plants sampled appear to be dying. However, this only accounts for about 120 plants/acre. Few seedlings were encountered



and no young plants were sampled. The very dry conditions of this season are mostly responsible for the trend on mahogany. A return to normal precipitation patterns will reverse this trend on this long lived shrub. Mountain big sagebrush, the other key browse on the site, displays many of the same trends as mahogany. Use is actually more moderate compared to 1995, but percent decadence has doubled and 46% of the decadent sagebrush were classified as dying. No seedlings were encountered and recruitment from young plants is poor. Trend for the herbaceous understory is up slightly. Sum of nested frequency of perennial grasses increased slightly and cover increased three-fold. The dominant grass, sheep fescue, increased significantly in nested frequency. Nested frequency of perennial forbs remained fairly stable.

#### TREND ASSESSMENT

soil - stable (3)

browse - down slightly (2)

herbaceous understory - up slightly (4)

#### HERBACEOUS TRENDS --

Herd unit 08B, Study no: 6

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	b153	a114	b162	20	64	51	61	.79	2.04
G	Bouteloua gracilis	-	-	3	-	-	-	1	-	.15
G	Carex spp.	42	31	23	6	19	14	9	.45	.26
G	Festuca ovina	a62	b118	c226	36	27	54	76	2.84	10.77
G	Koeleria cristata	b28	ab26	a13	25	14	10	5	.12	.10
G	Oryzopsis hymenoides	a-	b5	a-	2	-	3	-	.21	-
G	Poa secunda	b221	a132	a120	50	85	55	39	1.36	5.42
G	Sitanion hystrix	a-	a-	b6	-	-	-	3	-	.06
G	Stipa comata	a28	b57	a23	19	15	25	9	.52	.39
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		534	483	576	158	224	212	203	6.31	19.22
Total for Grasses		534	483	576	158	224	212	203	6.31	19.22
F	Agoseris glauca	-	-	2	-	-	-	1	-	.00
F	Allium spp.	70	78	64	36	30	32	29	.36	.57
F	Antennaria rosea	b15	a3	a6	10	8	2	2	.03	.06
F	Androsace septentrionalis (a)	-	1	-	-	-	1	-	.00	-
F	Arabis spp.	b35	a6	a3	1	18	3	2	.01	.01
F	Aster spp.	c72	a-	b10	4	32	-	4	-	.09
F	Balsamorhiza sagittata	3	-	-	-	1	-	-	-	-
F	Calochortus nuttallii	a-	b13	a-	3	-	6	-	.03	-
F	Chenopodium fremontii (a)	-	b8	a-	-	-	3	-	.04	-
F	Collomia linearis (a)	-	b74	a-	-	-	30	-	.43	-
F	Comandra pallida	a19	ab30	b55	5	10	17	25	.19	.45
F	Collinsia parviflora (a)	-	b143	a20	-	-	52	10	.91	.05
F	Cryptantha spp.	22	13	30	20	11	5	13	.33	.55

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Delphinium nuttallianum	-	4	-	-	-	2	-	.01	-
F	Descurainia pinnata (a)	-	<sub>b</sub> 12	<sub>a</sub> -	-	-	4	-	.04	-
F	Draba spp. (a)	-	<sub>a</sub> 87	<sub>b</sub> 104	-	-	34	49	.59	1.08
F	Erigeron eatonii	<sub>b</sub> 43	<sub>b</sub> 43	<sub>a</sub> 5	22	21	19	3	.92	.09
F	Erigeron speciosus	<sub>a</sub> -	<sub>b</sub> 13	<sub>c</sub> 56	-	-	5	23	.22	1.09
F	Eriogonum umbellatum	<sub>a</sub> 24	<sub>ab</sub> 47	<sub>b</sub> 57	10	11	20	25	1.33	1.27
F	Gilia aggregata	-	-	-	4	-	-	-	-	-
F	Heterotheca villosa	17	14	26	3	9	7	11	.23	.78
F	Hymenoxys acaulis	19	37	21	19	9	17	10	.23	.29
F	Ipomopsis aggregata	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 11	-	-	-	5	-	.05
F	Lepidium spp. (a)	-	2	-	-	-	2	-	.01	-
F	Lithospermum ruderales	-	-	2	2	-	-	1	.00	.03
F	Lupinus argenteus	-	2	1	-	-	1	1	.00	.01
F	Machaeranthera canescens	<sub>b</sub> 6	<sub>a</sub> -	<sub>b</sub> 6	3	3	-	4	.00	.02
F	Microsteris gracilis (a)	-	<sub>b</sub> 96	<sub>a</sub> 5	-	-	44	3	.53	.01
F	Phacelia sericea	<sub>a</sub> 6	<sub>b</sub> 34	<sub>a</sub> 1	5	5	16	1	.08	.03
F	Polygonum douglasii (a)	-	<sub>b</sub> 45	<sub>a</sub> 8	-	-	21	3	.10	.01
F	Sedum lanceolatum	<sub>a</sub> 50	<sub>b</sub> 103	<sub>b</sub> 85	37	26	40	43	.79	.68
F	Senecio multilobatus	1	6	3	-	1	3	2	.04	.01
F	Taraxacum officinale	-	3	-	-	-	2	-	.01	-
F	Townsendia incana	1	-	-	-	1	-	-	-	-
F	Unknown forb-perennial	-	3	-	47	-	1	-	.03	-
F	Zigadenus paniculatus	-	-	3	-	-	-	1	-	.03
Total for Annual Forbs		0	468	137	0	0	191	65	2.67	1.16
Total for Perennial Forbs		403	452	447	231	196	198	206	4.90	6.14
Total for Forbs		403	920	584	231	196	389	271	7.58	7.31

Values with different subscript letters are significantly different at  $\alpha = 0.10$

## BROWSE TRENDS --

Herd unit 08B, Study no: 6

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Amelanchier alnifolia	4	1	.91	.21
B	Artemisia frigida	0	2	-	-
B	Artemisia nova	3	0	-	-
B	Artemisia tridentata vaseyana	63	61	5.65	6.80
B	Cercocarpus montanus	61	43	16.22	12.24
B	Chrysothamnus viscidiflorus viscidiflorus	44	48	1.65	1.72
B	Gutierrezia sarothrae	0	2	-	-
B	Juniperus osteosperma	0	1	-	-
B	Mahonia repens	9	9	.69	.19
B	Opuntia spp.	22	23	.57	.24
B	Pediocactus simpsonii	3	8	-	.33
B	Purshia tridentata	4	3	1.38	.30
B	Symphoricarpos oreophilus	2	0	.21	-
B	Tetradymia canescens	6	10	.30	.18
Total for Browse		221	211	27.61	22.24

## BASIC COVER --

Herd unit 08B, Study no: 6

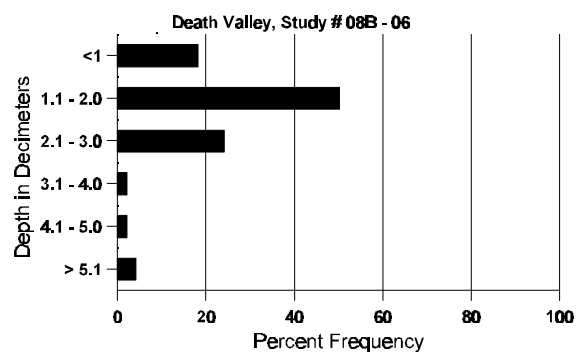
Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	354	361	7.00	12.00	35.36	48.55
Rock	63	62	4.00	5.25	2.33	3.81
Pavement	27	57	0	.25	.47	.39
Litter	396	381	59.25	58.75	60.37	53.99
Cryptogams	118	151	1.00	9.50	2.96	5.01
Bare Ground	221	241	28.75	14.25	18.35	20.98

## SOIL ANALYSIS DATA --

Herd Unit 8B, Study # 6, Study Name: Death Valley

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
9.97	66.8 (11.26)	6.9	85.4	5.7	8.9	1.5	2.45	76.8	0.7

## Stoniness Index



### PELLET GROUP FREQUENCY --

Herd unit 08B, Study no: 6

Type	Quadrat Frequency		Pellet Transect	
			Pellet Groups per Acre	Days Use per Acre (ha)
	'95	'00	00	00
Rabbit	12	26	435	N/A
Moose	-	1	9	0.5 (1)
Elk	17	19	618	48 (117)
Deer	37	14	757	58 (144)

### BROWSE CHARACTERISTICS --

Herd unit 08B, Study no: 6

A G R E		Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total			
		1	2	3	4	5	6	7	8	9	1	2	3	4							
Amelanchier alnifolia																					
M	'82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0			
	'88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0			
	'95	1	1	-	-	2	-	-	-	-	4	-	-	-	80	64	69	4			
	'00	1	-	-	-	-	-	-	-	-	1	-	-	-	20	49	58	1			
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>										
		'82			00%			00%			00%										
		'88			00%			00%			00%										
		'95			75%			00%			00%			-75%							
		'00			00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)														'82	0	Dec:	-				
														'88	0		-				
														'95	80		-				
														'00	20		-				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia frigida																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	1	-	-	-	-	-	-	-	-	-	1	-	-	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	4	-	-	-	-	-	-	-	-	-	4	-	-	266	4	5	4
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	4	7	0
	00	2	-	-	-	-	-	-	-	-	-	2	-	-	40	4	4	2
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	332		-			
												'95	0		-			
												'00	40		-			
Artemisia nova																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	1	-	1	-	-	-	-	-	2	-	-	40	11	20	2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	1	-	-	-	-	-	-	-	1	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		33%			67%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	0%			
												'88	0		0%			
												'95	60		33%			
												'00	0		0%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia tridentata vaseyana																		
S	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	88	3	-	-	-	-	-	-	-	-	3	-	-	-	200		3	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	5	-	-	-	-	-	-	-	-	5	-	-	-	333		5	
	88	10	5	-	-	-	-	1	-	-	16	-	-	-	1066		16	
	95	5	2	1	1	-	-	-	-	-	9	-	-	-	180		9	
	00	5	1	-	-	-	-	-	-	-	6	-	-	-	120		6	
M	82	6	6	-	-	-	-	-	-	-	12	-	-	-	800	14 25	12	
	88	9	10	3	-	-	-	-	-	-	22	-	-	-	1466	11 15	22	
	95	25	16	34	3	1	-	-	-	-	79	-	-	-	1580	14 26	79	
	00	30	21	3	4	4	2	-	-	-	63	-	1	-	1280	16 28	64	
D	82	-	7	-	-	-	-	-	-	-	6	-	1	-	466		7	
	88	5	8	1	-	-	-	-	-	-	14	-	-	-	933		14	
	95	6	5	6	2	-	-	-	-	-	13	-	-	6	380		19	
	00	13	21	1	3	2	-	1	-	-	21	-	1	19	820		41	
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	240		12	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	520		26	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
		'82			54%			00%			+54%							
		'88			44%			08%			-38%							
		'95			22%			38%			+ 4%							
		'00			44%			05%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	1599	Dec:	29%			
												'88	3465		27%			
												'95	2140		18%			
												'00	2220		37%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Cercocarpus montanus																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	3	-	-	-	-	-	-	-	-	3	-	-	-	200		3	
	95	2	2	1	2	-	-	-	-	-	7	-	-	-	140		7	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	82	10	4	-	-	-	-	-	-	-	14	-	-	-	933	34	8	
	88	-	4	1	-	-	-	-	-	-	5	-	-	-	333	36	44	
	95	1	3	9	1	43	18	-	-	-	75	-	-	-	1500	34	51	
	00	2	13	-	3	14	8	1	-	-	41	-	-	-	820	38	62	
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	1	1	-	-	-	1	-	-	1	40		2	
	00	4	2	-	1	2	2	-	-	1	6	-	-	6	240		12	
% Plants Showing		Moderate Use			Heavy Use			Poor Vigor			%Change							
'82		29%			00%			00%			-43%							
'88		50%			13%			00%			+68%							
'95		58%			35%			01%			-37%							
'00		58%			21%			11%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	933	Dec:	0%			
												'88	533		0%			
												'95	1680		2%			
												'00	1060		23%			
Chrysanthamnus viscidiflorus viscidiflorus																		
Y	82	6	-	-	-	-	-	-	-	-	6	-	-	-	400		6	
	88	5	-	-	-	-	-	-	-	-	5	-	-	-	333		5	
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	00	5	-	-	-	-	-	-	-	-	5	-	-	-	100		5	
M	82	14	-	-	-	-	-	-	-	-	14	-	-	-	933	7	8	
	88	21	-	-	-	-	-	-	-	-	18	-	3	-	1400	10	11	
	95	70	1	-	3	-	-	-	-	-	74	-	-	-	1480	10	15	
	00	77	-	1	9	-	-	3	-	-	74	-	16	-	1800	9	11	
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	4	1	-	2	-	-	-	-	-	6	-	-	1	140		7	
% Plants Showing		Moderate Use			Heavy Use			Poor Vigor			%Change							
'82		00%			00%			00%			+29%							
'88		00%			00%			11%			-19%							
'95		01%			00%			00%			+25%							
'00		.98%			.98%			17%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	1333	Dec:	0%			
												'88	1866		7%			
												'95	1520		0%			
												'00	2040		7%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Gutierrezia sarothrae																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	7	-	-	-	-	-	-	-	-	-	7	-	-	466	7	7	7
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	5	4	0
	00	1	-	-	-	-	-	-	-	-	-	-	-	1	20	-	-	1
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	2	-	-	-	-	-	-	-	-	-	2	-	-	133			2
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	-	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>				<u>Heavy Use</u>				<u>Poor Vigor</u>				<u>%Change</u>				
'82		00%				00%				00%								
'88		00%				00%				00%								
'95		00%				00%				00%								
'00		00%				00%				100%								
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	0%			
												'88	599		22%			
												'95	0		0%			
												'00	40		50%			
Juniperus osteosperma																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	1	-	-	-	1	-	-	20			1
% Plants Showing		<u>Moderate Use</u>				<u>Heavy Use</u>				<u>Poor Vigor</u>				<u>%Change</u>				
'82		00%				00%				00%								
'88		00%				00%				00%								
'95		00%				00%				00%								
'00		00%				00%				00%								
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	0		-			
												'00	20		-			



A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Mahonia repens																		
S	82	4	-	-	-	-	-	-	-	-	4	-	-	-	266		4	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	12	-	-	-	-	-	-	-	-	12	-	-	-	800		12	
	88	25	-	-	-	-	-	-	-	-	25	-	-	-	1666		25	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	9	-	-	-	-	-	-	-	-	9	-	-	-	180		9	
M	82	20	-	-	-	-	-	-	-	-	20	-	-	-	1333	7 2	20	
	88	6	-	-	-	-	-	-	-	-	6	-	-	-	400	2 2	6	
	95	29	-	-	31	-	-	8	-	-	68	-	-	-	1360	3 6	68	
	00	42	-	-	9	-	-	-	-	-	51	-	-	-	1020	3 6	51	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			- 3%							
'88		00%			00%			00%			-34%							
'95		00%			00%			00%			-12%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	2133	Dec:	-			
												'88	2066		-			
												'95	1360		-			
												'00	1200		-			
Opuntia spp.																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	88	5	-	-	-	-	-	-	-	-	5	-	-	-	333		5	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	11	-	-	4	-	-	-	-	-	15	-	-	-	300		15	
M	82	7	-	-	-	-	-	-	-	-	7	-	-	-	466	2 7	7	
	88	5	-	-	-	-	-	-	-	-	5	-	-	-	333	3 9	5	
	95	56	-	-	1	-	-	-	-	-	57	-	-	-	1140	3 9	57	
	00	42	-	-	3	1	-	-	-	-	46	-	-	-	920	2 7	46	
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	-	-	-	1	20		1	
	00	2	-	-	-	-	-	-	-	-	1	-	-	1	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%			+20%							
'88		00%			00%			00%			+44%							
'95		00%			00%			02%			+ 6%							
'00		02%			00%			02%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	532	Dec:	0%			
												'88	666		0%			
												'95	1180		2%			
												'00	1260		3%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Pediocactus simpsonii																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60	2	3	
	00	6	-	-	2	-	-	-	-	-	7	-	1	-	160	5	8	
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	1	-	-	-	-	-	-	-	-	1	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		00%			00%			00%			+67%							
'00		00%			00%			22%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	0%			
												'88	0		0%			
												'95	60		0%			
												'00	180		11%			
Purshia tridentata																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	-	2	-	3	2	-	-	-	-	7	-	-	-	140	19	7	
	00	1	-	-	1	1	-	-	-	-	3	-	-	-	60	16	3	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'82		00%			00%			00%										
'88		00%			00%			00%										
'95		57%			00%			00%			-57%							
'00		33%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	140		-			
												'00	60		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Rosa woodsii																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	5	-	-	-	-	-	-	-	-	5	-	-	-	333			5
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
% Plants Showing		<u>Moderate Use</u>				<u>Heavy Use</u>				<u>Poor Vigor</u>				<u>%Change</u>				
'82		00%				00%				00%								
'88		00%				00%				00%								
'95		00%				00%				00%								
'00		00%				00%				00%								
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	333		-			
												'95	0		-			
												'00	0		-			
Symphoricarpos oreophilus																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	1	-	-	-	-	-	1	-	-	-	20	15	25	1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	21	71	0
% Plants Showing		<u>Moderate Use</u>				<u>Heavy Use</u>				<u>Poor Vigor</u>				<u>%Change</u>				
'82		00%				00%				00%								
'88		00%				00%				00%								
'95		00%				00%				00%								
'00		00%				00%				00%								
Total Plants/Acre (excluding Dead & Seedlings)												'82	0	Dec:	-			
												'88	0		-			
												'95	40		-			
												'00	0		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Tetradymia canescens																		
Y	82	4	-	-	-	-	-	-	-	-	4	-	-	-	266		4	
	88	8	2	-	-	-	-	-	-	-	10	-	-	-	666		10	
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	00	2	-	-	-	-	-	-	-	-	1	-	1	-	40		2	
M	82	10	-	-	-	-	-	-	-	-	8	2	-	-	666	8 13	10	
	88	3	1	-	-	-	-	1	-	-	5	-	-	-	333	9 10	5	
	95	12	2	-	-	-	-	-	-	-	14	-	-	-	280	10 15	14	
	00	8	-	-	1	-	-	-	-	-	3	-	6	-	180	9 14	9	
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	88	8	-	-	-	-	-	-	-	-	8	-	-	-	533		8	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	-	-	-	-	-	-	-	1	-	-	1	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
		'82			00%			00%			+39%							
		'88			13%			00%			-79%							
		'95			13%			00%			-19%							
		'00			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'82	932	Dec:	0%			
												'88	1532		35%			
												'95	320		0%			
												'00	260		15%			

## Trend Study 8B-7-00

Study site name: Antelope Flat .

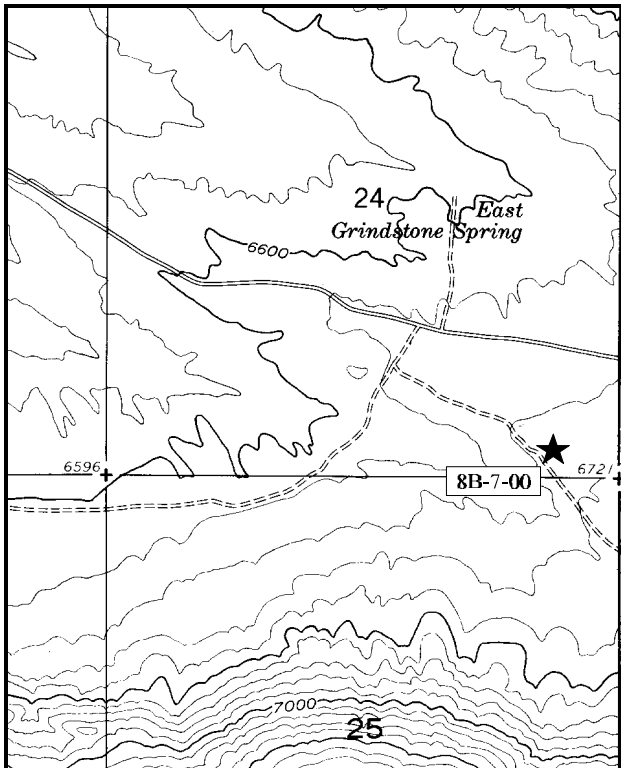
Range type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 165°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft.), line 4 (71ft). Belt 2 rebar @ 1ft.

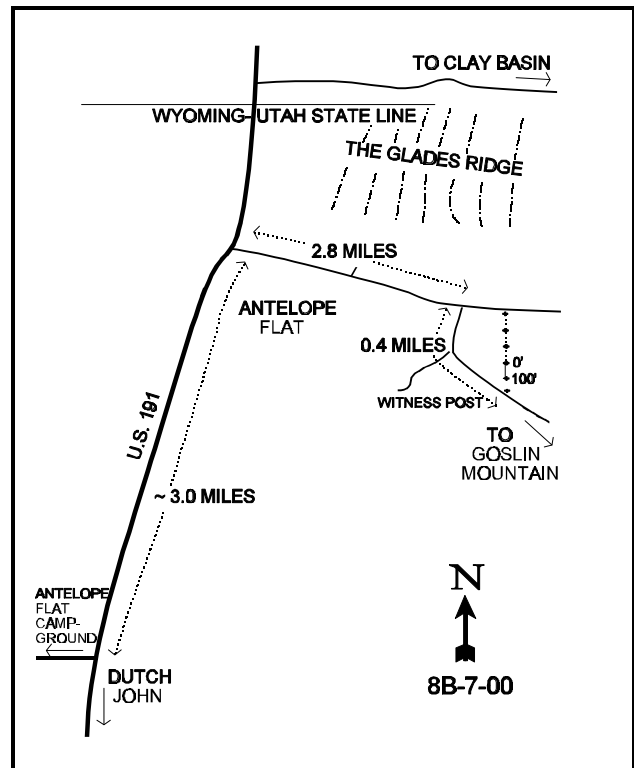
### LOCATION DESCRIPTION

From Dutch John, proceed north towards Antelope Flat on Highway U.S. 191 for approximately 8 miles. Before the Wyoming border, turn east on the Antelope Flat Road towards Goslin Mountain. Go 2.8 miles and turn right towards Goslin Mountain. Go 0.1 miles to a fork. Bear left on the main fork towards the mountain and proceed 0.3 miles to a witness post on the north side of the road. From the witness post walk approximately 100 feet (22 paces) north into the sagebrush to the 100-foot end of the baseline. The 0-foot end of the frequency baseline is 100 feet north.



Map Name: Dutch John

Township 3N, Range 22E, Section 24



Diagrammatic Sketch

UTM 4537316.266 N, 636375.882 E

## DISCUSSION

### Trend Study No. 8B-7 (9-10)

This trend study was established on Antelope Flat in September of 1988. The long sagebrush covered valley stretches from Flaming Gorge Reservoir, east to Goslin Mountain. The study is located at the base and north side of Dutch John and Goslin Mountains at an elevation of 6,650 feet. The slope is gentle (2-3%) with a northwest aspect. Deer and antelope can be found in the valley year round, while elk from Goslin Mountain also utilize the lower valleys as winter range. Pellet group data from 2000 estimate 22 elk, 7 deer and 9 cow days use/acre (54 edu/ha, 17 ddu/ha, and 22 cdu/ha). Approximately half of the elk pellet groups appeared to be from the previous fall, while the other half were from the spring of 2000. Deer pellet groups were all from winter use. Approximately 90% of the cattle pats were from the previous fall while about 10% were fresh. There were some cattle in the area when the site was read on July 6<sup>th</sup> 2000, but they should be moving further up the mountain soon. Cattle graze this allotment on a deferred rotation system. They are on the unit either early (May 1 to July 20) or late (September 5-November 20) in the season. Cattle use was light in 1995, likely due to prolonged drought and the distance from water. Utilization was light to moderate in 2000. Rabbits appear to be abundant on this site (see pellet group table). A few antelope and sage grouse also use the area.

The soil would appear to be moderately deep, but compacted below in the sub-surface horizons. A clay hardpan is found at approximately 9-10 inches in depth. As a result, effective rooting depth is estimated at only about 10 inches. The surface layer is a sandy loam with a neutral pH. Very little rock or gravel are on the surface or within the profile. Consequently, it is more susceptible to wind and water erosion. Phosphorus is limited at only 4.9 ppm. Values less than 10 ppm can limit normal plant growth and development. Percent cover of bare ground is moderately high with most occurring in the shrub interspaces. Cover is a relatively high for cryptogams which covered 6% of the soil surface in 1988, increasing to nearly 8% by 1995 and down to 5% in 2000. This along with the vegetative and litter cover, combined with the gentle terrain, adequately protect the soil from severe erosion.

The site supports a moderately dense stand of Wyoming big sagebrush which had an estimated density of 7,200 plants/acre in 1988 and 5,620 by 1995. The change in density comes primarily from a reduction in the proportion of decadent plants in the population which declined from 3,400 plants/acre in 1988 to 1,220 by 1995. The number of mature sagebrush actually increased from 2,800 to 3,820 plants/acre. During the 1988 reading, 47% of the sagebrush was classified as decadent with 43% of the population displaying heavy use. Vigor was generally good but annual growth was low (<1") with the average mature plant measuring 15" in height with a crown measurement of 17".

During the 1995 reading, 35% of the sagebrush displayed heavy use. Vigor was generally good with percent decadency declining to 22%. One noted downward trend was that the percentage of the decadent plants which were classified as dying (>50% crown death) had increased from 8% in 1988 to 31% in 1995. Photos showed an improvement in annual growth due to the wet spring of 1995. Average height and crown measurements increased respectively that year to 18 x 32 inches. Reproductive potential and the number of young plants declined, but they were still acceptable at 1% and 10% respectively. Density remained stable in 2000, but percent decadence increased to 46% with about 36% of the decadent sagebrush classified as dying. Use was only light to moderate, indicating that the increase in decadence was primarily due to drought. Because of the dry conditions in 2000, many of the sagebrush were already dropping their leaves during the first week of July. Reproduction in the form of seedlings and young would be considered marginal and not enough to maintain the population if conditions do not improve. These trends are primarily being driven by the prolonged drought in conjunction with intraspecific competition. Trends will improve with a return to normal or near-normal precipitation patterns.

Mountain low rabbitbrush is also numerous with an estimated density of 7,199 plants/acre in 1988 and 6,000 by 2000. These shrubs are mostly not utilized and in good vigor. Small numbers of slenderbush eriogonum, snakeweed and prickly pear were also encountered on the site.

Grasses and forbs are diverse and fairly abundant for a Wyoming big sagebrush site. Most are found growing in close proximity to sagebrush plants. The most abundant grasses include Sandberg bluegrass, mutton bluegrass and thickspike wheatgrass. A variety of forbs are found on the site but most are uncommon. The most numerous perennial forbs include: hoods phlox, longleaf phlox and Eaton fleabane. Several annual forbs are also found on the site.

#### 1988 APPARENT TREND ASSESSMENT

The site has 46% litter cover and 10% basal vegetative cover. Although the shrub interspaces are well vegetated for this range type, there is a significant amount of bare ground (37%). The browse trend appears to be declining due to heavy use and a high decadency rate (47%). Recruitment appears good however with abundant seedlings and young. The herbaceous understory is fairly abundant for a Wyoming sagebrush site.

#### 1995 TREND ASSESSMENT

Basic ground cover characteristics have improved since 1988. Even though percent litter cover declined slightly, cover of cryptogams increased, and percent cover for bare ground decreased to 26%. Trend for soil is up slightly. The browse trend is stable. The key browse species, Wyoming big sagebrush, has declined in overall density but shows less heavy use and an improving rate of decadency (47% to 22%). The population could decline further because 380 decadent plants/acre are classified as dying. However, there appears to be a sufficient number of young plants (580/acre) to replace them. The herbaceous trend is slightly down due to a decline in the sum of nested frequency of perennial grasses and forbs. Annual forbs were sampled in 1995. They dominated the forb composition by providing 71% of the forb cover.

##### TREND ASSESSMENT

soil - slightly up (4)

browse - stable (3)

herbaceous understory - slightly down (2)

#### 2000 TREND ASSESSMENT

Trend for soil is down slightly. Relative percent cover of bare ground has increased slightly, while cover of cryptogams has declined slightly. Relative percent cover of litter has declined slightly with relative cover for vegetation increasing slightly since 1995. In addition, the proportion of protective ground cover (vegetation, litter and cryptogams) to bare ground has declined slightly from 2.9:1 to 2.7:1. Trend for browse is down slightly due to an increase in percent decadence of Wyoming big sagebrush from 22% to 46%. In addition, 36% or 960 plants/acre of the decadent sagebrush were classified as dying. Recruitment from young plants is currently marginal at 8%. Use is actually more moderate compared to 1995, indicating that these trends are being driven more by drought. A return to normal precipitation patterns will reverse these downward browse trends. Trend for the herbaceous understory is stable. Sum of nested frequency for perennial grasses and forbs have remained similar to 1995. Nested frequency for cheatgrass, an annual, increased significantly while frequency of all annual forbs declined.

##### TREND ASSESSMENT

soil - down slightly (2)

browse - down slightly (2)

herbaceous understory - stable (3)

HERBACEOUS TRENDS --  
Herd unit 08B, Study no: 7

T y p e	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	238	190	158	89	71	59	.83	2.54
G	Agropyron spicatum	<sub>a</sub> 18	<sub>b</sub> 110	<sub>a</sub> 22	6	42	9	.61	.32
G	Bromus tectorum (a)	-	<sub>a</sub> 66	<sub>b</sub> 120	-	27	41	.50	2.74
G	Carex spp.	<sub>b</sub> 9	<sub>a</sub> -	<sub>ab</sub> 3	4	-	1	-	.03
G	Koeleria cristata	<sub>c</sub> 55	<sub>a</sub> -	<sub>b</sub> 36	24	-	13	-	.62
G	Oryzopsis hymenoides	13	20	12	6	10	7	.20	.25
G	Poa fendleriana	<sub>a</sub> 5	<sub>b</sub> 32	<sub>c</sub> 113	2	13	45	.43	2.86
G	Poa secunda	184	159	173	75	58	66	3.00	1.90
G	Sitanion hystrix	<sub>b</sub> 67	<sub>a</sub> 34	<sub>a</sub> 35	33	19	14	.30	1.06
G	Stipa comata	<sub>c</sub> 87	<sub>b</sub> 31	<sub>a</sub> 5	37	16	2	.28	.03
G	Vulpia octoflora (a)	-	1	3	-	1	1	.00	.01
Total for Annual Grasses		0	67	123	0	28	42	0.50	2.75
Total for Perennial Grasses		676	576	557	276	229	216	5.65	9.63
Total for Grasses		676	643	680	276	257	258	6.17	12.39
F	Agoseris glauca	<sub>a</sub> -	<sub>b</sub> 22	<sub>a</sub> 1	-	10	1	.05	.01
F	Allium spp.	<sub>ab</sub> 4	<sub>b</sub> 11	<sub>a</sub> -	2	6	-	.04	-
F	Antennaria rosea	<sub>c</sub> 62	<sub>a</sub> 1	<sub>b</sub> 28	26	1	12	.00	.54
F	Arabis spp.	9	10	7	4	5	3	.02	.01
F	Astragalus convallarius	31	23	29	12	12	14	.25	.28
F	Collinsia parviflora (a)	-	<sub>b</sub> 57	<sub>a</sub> 24	-	21	8	.25	.14
F	Cordylanthus ramosus (a)	-	<sub>b</sub> 187	<sub>a</sub> 57	-	73	24	6.05	.27
F	Crepis acuminata	-	3	-	-	1	-	.00	-
F	Cymopterus longipes	<sub>a</sub> 15	<sub>a</sub> 15	<sub>b</sub> 34	7	7	17	.03	.26
F	Descurainia pinnata (a)	-	3	-	-	1	-	.00	-
F	Erigeron eatonii	<sub>a</sub> 7	<sub>a</sub> 19	<sub>b</sub> 47	4	11	23	.08	.51
F	Eriogonum umbellatum	-	-	3	-	-	1	-	.03
F	Gayophytum ramosissimum (a)	-	<sub>b</sub> 17	<sub>a</sub> -	-	6	-	.03	-
F	Gilia inconspicua (a)	-	<sub>b</sub> 10	<sub>a</sub> 1	-	4	1	.02	.00
F	Lepidium spp. (a)	-	3	-	-	1	-	.00	-
F	Lomatium spp.	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 5	-	-	3	-	.06
F	Machaeranthera canescens	-	5	-	-	2	-	.03	-
F	Microsteris gracilis (a)	-	<sub>b</sub> 118	<sub>a</sub> 40	-	40	16	.42	.08
F	Penstemon humilis	<sub>b</sub> 60	<sub>b</sub> 54	<sub>a</sub> 24	28	25	12	.45	.11
F	Phlox hoodii	<sub>b</sub> 139	<sub>a</sub> 95	<sub>a</sub> 90	68	44	39	1.23	2.40
F	Phlox longifolia	<sub>b</sub> 153	<sub>a</sub> 97	<sub>a</sub> 82	66	41	32	.22	.31
F	Polygonum douglasii (a)	-	<sub>b</sub> 45	<sub>a</sub> 7	-	19	3	.09	.01



T y p e	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
F	Ranunculus testiculatus (a)	-	-	3	-	-	1	-	.00
F	Schoenocrambe linifolia	<sub>a</sub> -	<sub>b</sub> 12	<sub>b</sub> 5	-	5	3	.02	.04
F	Sphaeralcea coccinea	40	26	26	16	11	13	.18	.31
F	Trifolium gymnocarpon	<sub>a</sub> -	<sub>b</sub> 55	<sub>c</sub> 74	-	25	33	.15	.49
Total for Annual Forbs		0	440	132	0	165	53	6.88	0.51
Total for Perennial Forbs		520	448	455	233	206	206	2.79	5.37
Total for Forbs		520	888	587	233	371	259	9.67	5.89

Values with different subscript letters are significantly different at % = 0.10

#### BROWSE TRENDS --

Herd unit 08B, Study no: 7

T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia tridentata wyomingensis	97	100	16.13	19.50
B	Chrysothamnus viscidiflorus viscidiflorus	90	89	5.16	6.06
B	Eriogonum microthecum	2	4	.01	.04
B	Gutierrezia sarothrae	1	8	-	.09
B	Opuntia polyacantha	18	20	.36	.84
Total for Browse		208	221	21.67	26.54

#### BASIC COVER --

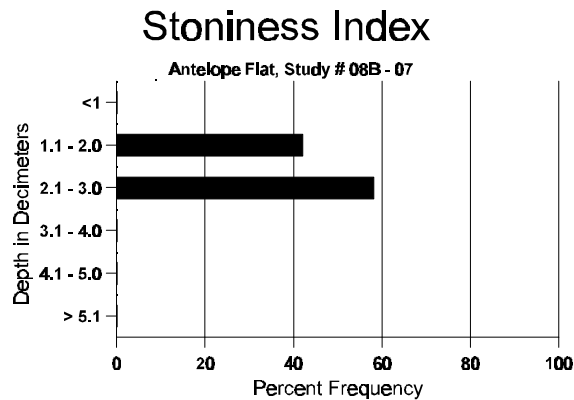
Herd unit 08B, Study no: 7

Cover Type	Nested Frequency		Average Cover %		
	'95	'00	'88	'95	'00
Vegetation	348	345	10.25	36.86	47.01
Rock	64	4	0	.19	.01
Pavement	150	75	1.00	.55	.36
Litter	394	371	45.50	42.59	46.87
Cryptogams	207	118	6.00	7.77	5.06
Bare Ground	328	305	37.25	26.36	35.77

# SOIL ANALYSIS DATA --

Herd Unit 8B, Study # 7, Study Name: Antelope Flat

Effective rooting depth (inches)	Temp °F (depth)	pH	% sand	% silt	% clay	% OM	PPM P	PPM K	dS/m
9.98	68.8 (9.92)	7.0	65.4	17.0	17.6	1.7	4.9	118.4	0.8



# PELLET GROUP FREQUENCY --

Herd unit 08B, Study no: 7

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre 00	Days Use per Acre (ha) 00
Rabbit	8	4	-	-
Elk	5	5	287	22 (55)
Deer	38	1	87	7 (17)
Antelope	-	-	9	1 (2)
Sage Grouse	-	-	26	N/A
Cattle	1	1	113	9 (23)

## BROWSE CHARACTERISTICS --

Herd unit 08B, Study no: 7

Artemisia tridentata wyomingensis																		
A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
S	88	6	-	-	2	-	-	-	-	-	8	-	-	-	533		8	
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
Y	88	9	5	1	-	-	-	-	-	-	14	1	-	-	1000		15	
	95	19	6	2	2	-	-	-	-	-	29	-	-	-	580		29	
	00	21	1	-	-	-	-	-	-	-	20	-	2	-	440		22	
M	88	2	16	24	-	-	-	-	-	-	41	1	-	-	2800	15 17	42	
	95	3	99	59	-	12	18	-	-	-	191	-	-	-	3820	18 32	191	
	00	100	30	3	2	-	-	-	-	-	134	-	1	-	2700	19 31	135	
D	88	12	18	21	-	-	-	-	-	-	43	2	2	4	3400		51	
	95	4	25	9	-	10	11	2	-	-	42	-	-	19	1220		61	
	00	93	33	8	-	-	-	-	-	-	79	-	7	48	2680		134	
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	620		31	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	760		38	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		36%			43%			06%			-22%							
'95		54%			35%			07%			+ 3%							
'00		22%			04%			20%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	7200	Dec:	47%			
												'95	5620		22%			
												'00	5820		46%			
Ceratoides lanata																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	3 7	0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'95	0		-			
												'00	0		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Chrysothamnus viscidiflorus viscidiflorus																		
S	88	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2	
	95	1	2	-	-	-	-	-	-	-	3	-	-	-	60		3	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	88	17	3	1	2	-	-	-	-	-	23	-	-	-	1533		23	
	95	32	1	-	3	-	-	-	-	-	36	-	-	-	720		36	
	00	15	-	-	-	-	-	-	-	-	15	-	-	-	300		15	
M	88	30	5	-	4	-	-	-	-	-	39	-	-	-	2600	9 8	39	
	95	224	4	1	24	-	-	-	-	-	251	-	-	2	5060	10 16	253	
	00	237	-	-	4	-	-	4	-	-	233	1	11	-	4900	9 15	245	
D	88	23	12	9	2	-	-	-	-	-	37	-	9	-	3066		46	
	95	3	-	-	-	-	-	-	-	-	2	-	-	1	60		3	
	00	36	-	-	3	-	-	1	-	-	26	-	6	8	800		40	
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		19%			09%			08%			-19%							
'95		02%			.34%			01%			+ 3%							
'00		00%			00%			08%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	7199	Dec:	43%			
												'95	5840		1%			
												'00	6000		13%			
Eriogonum microthecum																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3	
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	- -	0	
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60	6 8	3	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20	5 4	1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%			+25%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'95	60		-			
												'00	80		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Gutierrezia sarothrae																	
S	88	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
Y	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
M	88	14	-	-	-	-	-	-	-	-	13	-	1	-	933	5 4	14
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	9 13	1
	00	23	-	-	1	-	-	-	-	-	24	-	-	-	480	5 7	24
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'88		00%			00%			07%			-98%						
'95		00%			00%			00%			+96%						
'00		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)												'88	999	Dec:	-		
												'95	20		-		
												'00	480		-		
Opuntia polyacantha																	
S	88	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1
Y	88	4	-	-	-	-	-	-	-	-	4	-	-	-	266		4
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1
M	88	5	-	-	-	-	-	-	-	-	5	-	-	-	333	4 7	5
	95	27	-	-	-	-	-	-	-	-	27	-	-	-	540	3 12	27
	00	22	-	-	-	-	-	-	-	-	22	-	-	-	440	4 9	22
D	88	3	-	-	-	-	-	-	-	-	2	-	-	1	200		3
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	3	-	-	-	-	-	-	-	-	-	-	-	3	60		3
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'88		00%			00%			08%			-30%						
'95		00%			00%			00%			- 7%						
'00		00%			00%			12%									
Total Plants/Acre (excluding Dead & Seedlings)												'88	799	Dec:	25%		
												'95	560		0%		
												'00	520		12%		

## Trend Study 8B-8-00

Study site name: Phil Pico Mountain .

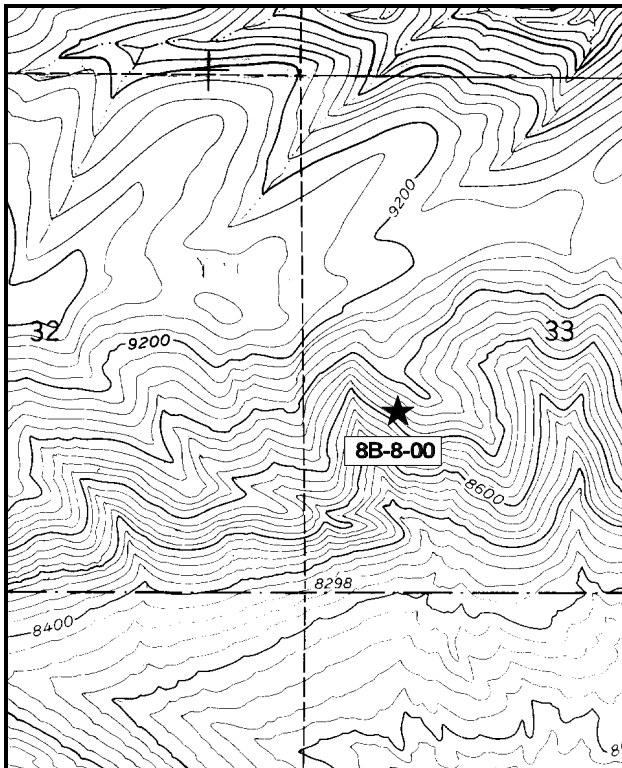
Range type: True Mountain Mahogany .

Compass bearing: frequency baseline 215°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft.), line 4 (71ft).

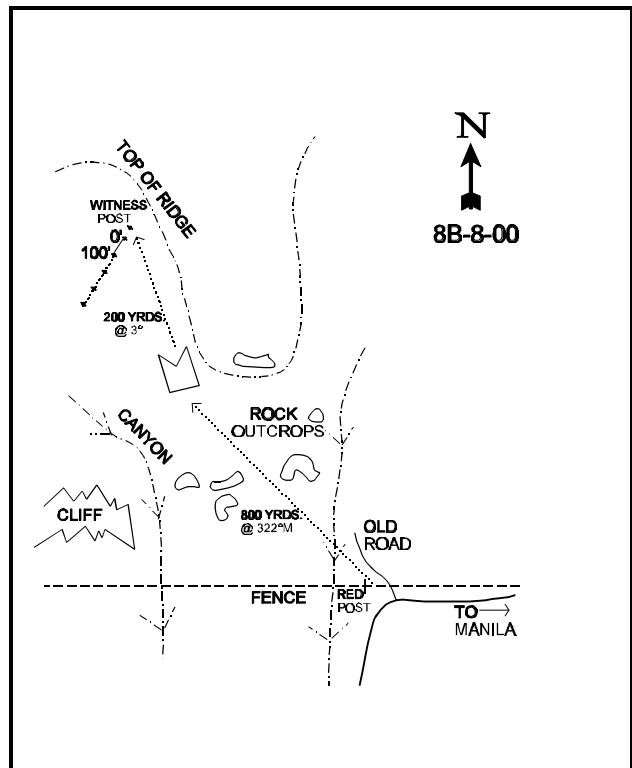
### LOCATION DESCRIPTION

West of Manila, on Highway U-43 1.9 miles from the Wyoming-Utah stateline, turn south off the highway. Follow Rt. 166 for 3.6 miles to an intersection. Turn to the right and go 1.6 miles to another fork. Bear right before crossing the creek and go 0.9 miles on a fairly rough road to the FS boundary fence. Continue 0.8 miles west along the fence. Stop where the road turns left away from the fence by a red post. The study is located on the slope below the ridge to the northwest. From the red witness post along the fence, hike about 1/4 mile NNW (322°M) up across the slope to a large square rock outcrop. Continue hiking about 200 yards directly north to the study site. The 0-foot baseline stake is tagged with browse tag #9080.



Map Name: Phil Pico Mountain

Township 3N, Range 18E, Section 33



Diagrammatic Sketch

UTM 4533503 N, 591689 E

## DISCUSSION

### Trend Study No. 8B-8 (9-18)

The Phil Pico Mountain trend study site is located on the south side of Phil Pico Mountain which is steep and rocky and covered mostly with mountain brush. There are scattered clumps of aspen and conifer in the protected drainages and an open sagebrush-grass type on the upper slopes and ridgetops. The site is located just below a narrow windswept ridge. It samples a steep (65% to 70%) southwest facing slope dominated by true mountain mahogany at an elevation of 8,800 feet. These south slopes are used mostly by wintering elk and to a lesser extent by deer. While cattle graze this state-owned land in summer, they utilize mainly the valley bottoms and more gentle slopes. Pellet group data taken along the study site baseline in 2000 estimate 40 elk and 7 deer days use/acre (99 edu/ha and 17 ddu/ha). Most of the pellet groups appear to be from fall use. Elk appear to have used the area more heavily in 1995 since quadrat frequency of elk pellet groups was twice as high compared to 2000. The decline in use is likely due to several mild winters since 1995.

Considering the harshness of the site on the dry, steep, rocky slope, there is a surprisingly high amount of vegetative cover (39.5% in 1995 and 57% in 2000). Sandstone and limestone rock are very common on the surface, making the slope loose and talus-like in places. Outcrops of old conglomerate rock are scattered throughout the hillside. The soil is relatively deep for this type of site with an effective rooting depth estimated at just over 12 inches. Texture is a sandy loam with a neutral pH. Soil penetrometer readings suggest that the majority of the rock is concentrated 4 to 8 inches below the surface. With the steep, talus slope, some erosion is expected. There is definite down slope soil movement, especially along game trails. Soil is also pedestalled on the uphill side of shrubs and bunch grasses but soil erosion does not appear to be serious. Herbaceous vegetative cover is critical for minimizing soil movement on this type of site.

True mountain mahogany provides the majority of the browse cover and the bulk of the available forage. There was an estimated density of 4,132 plants/acre in 1988. Eighteen percent were decadent plants. Some of the young and mature plants showed signs of insect damage. Use was heavy on 73% of the population. Seed production was moderate and leader growth about 4 to 5 inches in length. There was a fair amount of reproduction evident, with young and seedling age classes comprising 37% and 5% of the population respectively. During the 1995 reading, there were an estimated 3,120 plants/acre, 79% mature and only 2% decadent. Vigor was mostly good with 6% of the population displaying reduced vigor due to insect damage. During the 2000 reading, density remained identical to 1995 estimates. Use continues to be mostly moderate to heavy. Percent decadence increased from 3% to 15%. Due to the dry conditions, annual leader growth was relatively low averaging only 3.3 inches. Some plants displayed yellowing leaves and 33% of the decadent mahogany were classified as dying. No seedlings were found in 2000, but young plants account for 13% of the population which appear to be abundant enough to maintain the population. On average, the percentage of young plants within the population is 23%, where on average the number of dead plants in the population is less than 1%.

Mountain big sagebrush occurs across the slope offers additional and more nutritional winter forage. It has displayed mostly light to moderate use since 1988. Mountain big sagebrush is also showing the effects of the prolonged drought. Percent decadence is now ('00) moderately low, but 70% of the decadent plants were classified as dying. No seedlings were encountered in 2000 yet young plants accounted for 13% of the population and appear to be abundant enough to maintain the population. On average, the percentage of young within the population is 13%, while the average percent dead is less the 12%. Other browse include: serviceberry, fringed sagebrush, black sagebrush, winterfat, mountain low rabbitbrush and slenderbush eriogonum.

The herbaceous understory is surprisingly abundant with grasses producing almost 17% cover in 1995, increasing to 27% by 2000. Forbs are diverse but provide only about 3 to 4% cover on this harsh site. By far the most abundant grass consists of bluebunch wheatgrass which exhibits considerable vegetative production. Other common grasses include Indian ricegrass and the annual cheatgrass. Forbs are represented by a variety of species, but only a few including cryptantha, hoary aster and Hoods phlox are abundant.

#### 1988 APPARENT TREND ASSESSMENT

The amount of total rock cover reflects the rocky nature of the site. Rock cover is 19% and pavement cover is 24%. Together, they contribute to 43% of the surface cover, which is considered very high. Basal vegetative cover is good at 11%, but litter cover is unsatisfactory at only 38%. Trend for browse appears stable with adequate numbers of seedlings and young for mountain big sagebrush and true mountain mahogany. The composition of the herbaceous understory is good and dominated by native grasses. Forbs are diverse but not as numerous.

#### 1995 TREND ASSESSMENT

Percent bare ground has declined from 8% to only 2%. Soil movement down slope is unavoidable but not severe due to the abundance of well dispersed vegetation and litter cover. Trend for soil is slightly up. Trend for the key species, true mountain mahogany which makes up 81% of the total browse cover, is slightly up. The number of mature plants increased, while the number of decadent shrubs declined from 18% to only 3%. The proportion of shrubs displaying heavy use also declined from 73% in 1988 to 54% in 1995. The number of seedlings and young plants declined, but they still appear adequate to maintain the population. Trend for the secondary browse species, mountain big sagebrush, is slightly down, but only contributes to 7% of the total browse cover. The population has declined significantly with 55% of the decadent sagebrush classified as dying, indicating a further decline in population density in the future. However, there are not very many dead plants within the population, indicating that most of the decrease is because of the much larger sample now used to determine the density of shrubs giving a more accurate estimate of its population. This would still be considered a marginal site for mountain big sagebrush. The shallow, rocky soils coupled with drought conditions have further stressed the population. Since mountain mahogany provides 81% of the browse cover and the bulk of the forage on the site, overall browse trend is considered slightly up. It should be noted that with the increased sample size and much better sampling distribution, the population estimates for shrubs are much closer to reality. Trend for the herbaceous understory is down. Nested frequency of nearly all grass species have declined significantly. Sum of nested frequency of perennial forbs have also declined.

#### TREND ASSESSMENT

soil - slightly up (4)

browse - slightly up (4)

herbaceous understory - down (1)

#### 2000 TREND ASSESSMENT

Trend for soil appears fairly stable. Percent cover of bare ground has increased slightly, while litter cover has declined slightly. However, vegetation cover increased and herbaceous cover rose by 64%. In addition, the ratio of protective ground cover (vegetation, litter and cryptogams) to bare ground increased slightly. There is still unavoidable down slope soil movement but it is not severe. Trend for the key browse species, true mountain mahogany, is stable. Population density has remained stable and use is similar to 1995 estimates. Vigor is normal on most plants and percent decadence has risen but it is still low at 15%. Due to the dry conditions of 2000, some shrubs are displaying yellowing leaves and 33% of the decadent mahogany were classified as dying. No seedlings were encountered but young plants account for 13% of the population. Mountain big sagebrush



also appears stable but many plants are showing the effects of drought. Trend for the herbaceous understory is stable with similar sum of nested frequency values for perennial grasses and forbs.

# TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - stable (3)

## HERBACEOUS TRENDS --

Herd unit 08B, Study no: 8

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
G	Agropyron spicatum	297	287	309	97	96	97	10.99	19.74
G	Bromus tectorum (a)	-	<sub>b</sub> 152	<sub>a</sub> 53	-	55	22	2.53	.18
G	Carex spp.	<sub>b</sub> 36	<sub>b</sub> 33	<sub>a</sub> 9	17	11	5	.50	.39
G	Koeleria cristata	<sub>b</sub> 16	<sub>ab</sub> 7	<sub>a</sub> 4	9	5	1	.08	.03
G	Leucopoa kingii	-	2	4	-	1	1	.03	.03
G	Oryzopsis hymenoides	115	85	104	57	39	38	2.16	6.56
G	Poa fendleriana	-	-	2	-	-	2	-	.03
G	Poa secunda	<sub>b</sub> 45	<sub>a</sub> 23	<sub>a</sub> 19	19	11	7	.18	.18
Total for Annual Grasses		0	152	53	0	55	22	2.53	0.18
Total for Perennial Grasses		509	437	451	199	163	151	13.95	26.98
Total for Grasses		509	589	504	199	218	173	16.49	27.16
F	Arabis spp.	<sub>a</sub> -	<sub>b</sub> 7	<sub>b</sub> 6	-	4	3	.02	.01
F	Aster chilensis	<sub>b</sub> 25	<sub>a</sub> -	<sub>a</sub> 2	12	-	1	-	.00
F	Astragalus convallarius	-	7	8	-	3	3	.21	.21
F	Astragalus spp.	8	4	3	5	3	2	.06	.15
F	Balsamorhiza hookeri	1	-	-	1	-	-	-	-
F	Castilleja linariaefolia	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 3	-	-	3	-	.04
F	Camelina microcarpa (a)	-	<sub>a</sub> -	<sub>b</sub> 27	-	-	15	-	.10
F	Castilleja spp.	<sub>b</sub> 26	<sub>a</sub> -	<sub>a</sub> -	12	-	-	-	-
F	Chaenactis douglasii	28	24	19	16	10	12	.10	.14
F	Chenopodium leptophyllum (a)	-	<sub>b</sub> 19	<sub>a</sub> 3	-	11	2	.05	.01
F	Cirsium spp.	12	2	4	6	2	1	.06	.03
F	Comandra pallida	6	-	-	2	-	-	-	-
F	Collinsia parviflora (a)	-	3	2	-	1	1	.00	.00
F	Cruciferae	2	-	-	2	-	-	-	-
F	Cryptantha spp.	<sub>b</sub> 81	<sub>a</sub> 35	<sub>a</sub> 57	41	17	23	.48	1.06
F	Delphinium nuttallianum	65	52	6	29	25	2	.48	.09
F	Descurainia pinnata (a)	-	<sub>b</sub> 67	<sub>a</sub> 5	-	34	3	.39	.01
F	Erigeron spp.	-	1	3	-	1	2	.00	.01
F	Hymenoxys acaulis	-	2	-	-	1	-	.03	-

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'88	'95	'00	'88	'95	'00	'95	'00
F	<i>Ipomopsis aggregata</i>	-	3	-	-	2	-	.01	-
F	<i>Lappula occidentalis</i> (a)	-	<sub>b</sub> 8	<sub>a</sub> -	-	6	-	.03	-
F	<i>Leucelene ericoides</i>	<sub>b</sub> 10	<sub>a</sub> -	<sub>a</sub> -	4	-	-	-	-
F	<i>Lepidium</i> spp. (a)	-	3	-	-	1	-	.03	-
F	<i>Lesquerella</i> spp.	<sub>b</sub> 65	<sub>ab</sub> 66	<sub>a</sub> 31	33	32	15	.47	.22
F	<i>Linum lewisii</i>	6	5	2	3	2	1	.03	.03
F	<i>Lithospermum</i> spp.	1	-	1	1	-	1	-	.00
F	<i>Lomatium</i> spp.	-	-	3	-	-	1	-	.03
F	<i>Lychnis drummondii</i>	-	2	-	-	1	-	.00	-
F	<i>Machaeranthera canescens</i>	<sub>b</sub> 48	<sub>a</sub> 15	<sub>a</sub> 20	25	7	11	.07	.49
F	<i>Microsteris gracilis</i> (a)	-	1	-	-	1	-	.03	-
F	<i>Oenothera</i> spp.	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 9	-	-	4	-	.07
F	<i>Oxytropis sericea</i>	12	2	14	6	2	6	.19	.26
F	<i>Penstemon humilis</i>	<sub>b</sub> 66	<sub>a</sub> 35	<sub>a</sub> 21	30	16	11	.37	.43
F	<i>Physaria acutifolia</i>	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 8	-	-	4	-	.07
F	<i>Phlox hoodii</i>	<sub>a</sub> -	<sub>c</sub> 24	<sub>b</sub> 41	-	11	17	.22	.43
F	<i>Phlox longifolia</i>	<sub>c</sub> 46	<sub>a</sub> -	<sub>b</sub> 5	22	-	3	-	.01
F	<i>Senecio multilobatus</i>	<sub>a</sub> -	<sub>b</sub> 9	<sub>b</sub> 8	-	3	4	.04	.05
Total for Annual Forbs		0	101	37	0	54	21	0.53	0.12
Total for Perennial Forbs		508	295	274	250	142	130	2.89	3.88
Total for Forbs		508	396	311	250	196	151	3.43	4.01

Values with different subscript letters are significantly different at  $\alpha = 0.10$

## BROWSE TRENDS --

Herd unit 08B, Study no: 8

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Amelanchier utahensis	2	2	.01	.03
B	Artemisia frigida	63	62	.91	1.03
B	Artemisia tridentata vaseyana	36	36	1.51	2.73
B	Ceratoides lanata	2	0	-	-
B	Cercocarpus montanus	82	84	18.02	19.50
B	Chrysothamnus viscidiflorus lanceolatus	14	14	.07	.48
B	Eriogonum microthecum	55	40	1.59	1.51
B	Symphoricarpos oreophilus	5	6	.00	.30
B	Tetradymia canescens	1	1	.06	-
Total for Browse		260	245	22.21	25.60

## BASIC COVER --

Herd unit 08B, Study no: 8

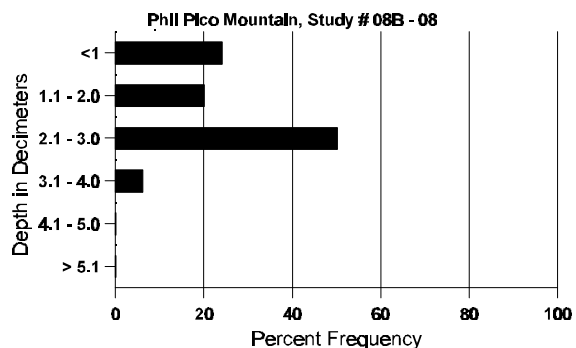
Cover Type	Nested Frequency		Average Cover %		
	'95	'00	'88	'95	'00
Vegetation	343	346	11.00	39.45	57.22
Rock	338	311	19.25	23.53	19.75
Pavement	274	326	23.25	11.68	30.17
Litter	391	372	38.00	40.21	36.86
Cryptogams	8	13	.25	.02	.11
Bare Ground	160	153	8.25	2.26	4.55

## SOIL ANALYSIS DATA --

Herd Unit 8B, Study # 8, Study Name: Phil Pico Mountain

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
12.31	N/A	7.0	69.0	20.1	10.9	3.7	5.2	86.4	1.4

## Stoniness Index



### PELLET GROUP FREQUENCY --

Herd unit 08B, Study no: 8

Type	Quadrat Frequency		Pellet Transect	
			Pellet Groups per Acre	Days Use per Acre (ha)
	'95	'00	00	00
Rabbit	8	-	9	N/A
Elk	51	26	96	40 (99)
Deer	25	7	522	7 (17)

### BROWSE CHARACTERISTICS --

Herd unit 08B, Study no: 8

Form Class (No. of Plants)																			Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
A G R E	Y	1	2	3	4	5	6	7	8	9	1	2	3	4												
Amelanchier utahensis																										
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0								
	95	-	-	-	4	-	-	-	-	-	4	-	-	-	80			4								
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0								
Y	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0								
	95	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5								
	00	4	-	-	12	-	-	-	-	-	16	-	-	-	320			16								
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0								
	95	-	-	1	-	-	-	-	-	-	1	-	-	-	20	16	9	1								
	00	-	1	-	-	-	-	-	-	-	1	-	-	-	20	16	12	1								
% Plants Showing		<u>Moderate Use</u>				<u>Heavy Use</u>				<u>Poor Vigor</u>				<u>%Change</u>												
'88		00%				00%				00%																
'95		00%				17%				00%				+65%												
'00		06%				00%				00%																
Total Plants/Acre (excluding Dead & Seedlings)														'88	0	Dec:	-									
														'95	120		-									
														'00	340		-									

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Artemisia frigida																	
S	88	5	-	-	1	-	-	-	-	-	6	-	-	-	400		6
	95	2	-	-	6	-	-	-	-	-	8	-	-	-	160		8
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
Y	88	75	2	1	14	-	-	6	-	-	98	-	-	-	6533		98
	95	10	-	-	12	-	-	-	-	-	22	-	-	-	440		22
	00	11	-	-	3	-	-	-	-	-	14	-	-	-	280		14
M	88	103	4	3	12	-	-	4	-	-	125	-	1	-	8400	5 4	126
	95	122	-	-	51	-	-	-	-	-	173	-	-	-	3460	9 7	173
	00	143	1	-	6	-	-	7	-	-	157	-	-	-	3140	5 7	157
D	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	00	1	-	-	-	-	-	-	-	-	-	-	-	1	20		1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'88		03%			02%			.44%			-74%						
'95		00%			00%			00%			-12%						
'00		.58%			00%			.58%									
Total Plants/Acre (excluding Dead & Seedlings)												'88	14933	Dec:	0%		
												'95	3900		0%		
												'00	3440		1%		
Artemisia nova																	
M	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66	4 7	1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	- -	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	- -	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'88		00%			00%			00%									
'95		00%			00%			00%									
'00		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)												'88	66	Dec:	-		
												'95	0		-		
												'00	0		-		

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia tridentata vaseyana																		
S	88	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2	
	95	-	-	-	1	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	88	2	1	-	2	-	-	-	-	-	5	-	-	-	333		5	
	95	4	-	-	1	-	-	-	-	-	5	-	-	-	100		5	
	00	7	-	-	-	-	-	-	-	-	7	-	-	-	140		7	
M	88	11	4	2	-	-	-	-	-	-	17	-	-	-	1133	11 16	17	
	95	10	12	4	4	4	-	-	-	-	34	-	-	-	680	11 24	34	
	00	26	7	1	3	-	1	-	-	-	38	-	-	-	760	12 22	38	
D	88	4	1	2	-	-	-	-	-	-	7	-	-	-	466		7	
	95	2	6	1	1	1	-	-	-	-	5	-	-	6	220		11	
	00	3	4	1	2	-	-	-	-	-	3	-	-	7	200		10	
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	160		8	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	80		4	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		21%			14%			00%			-48%							
'95		46%			10%			12%			+ 9%							
'00		20%			05%			13%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	1932	Dec:	24%			
												'95	1000		22%			
												'00	1100		18%			
Ceratoides lanata																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	1	-	-	1	-	-	-	-	-	2	-	-	-	40	11 13	2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'95	40		-			
												'00	0		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches)		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4		Ht.	Cr.	
Cercocarpus montanus																		
S	88	2	-	-	1	-	-	-	-	-	3	-	-	-	200		3	
	95	3	-	-	5	-	-	-	-	-	8	-	-	-	160			8
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	88	5	5	12	1	-	-	-	-	-	21	-	2	-	1533		23	
	95	9	5	3	8	3	-	-	-	-	28	-	-	-	560			28
	00	16	2	1	1	-	-	-	-	-	20	-	-	-	400			20
M	88	-	3	25	-	-	-	-	-	-	27	-	1	-	1866	27	24	28
	95	1	1	5	-	44	73	-	-	-	115	-	9	-	2480	29	39	124
	00	8	17	26	10	28	23	-	-	-	104	6	2	-	2240	29	40	112
D	88	1	2	8	-	-	-	-	-	-	11	-	-	-	733		11	
	95	-	-	-	1	-	3	-	-	-	4	-	-	-	80			4
	00	2	2	2	-	7	10	1	-	-	15	1	-	8	480			24
X	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		16%			73%			05%			-24%							
'95		34%			54%			06%			+ 0%							
'00		36%			40%			06%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	4132	Dec:	18%			
												'95	3120		3%			
												'00	3120		15%			
Chrysothamnus viscidiflorus lanceolatus																		
M	88	3	-	-	2	-	-	-	-	-	3	-	2	-	333	9	7	5
	95	16	-	-	4	-	-	-	-	-	20	-	-	-	400	10	14	20
	00	17	-	2	3	-	-	-	-	-	22	-	-	-	440	10	16	22
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			40%			+17%							
'95		00%			00%			00%			+ 9%							
'00		00%			09%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	333	Dec:	-			
												'95	400		-			
												'00	440		-			

A Y G R E	Y	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Eriogonum microthecum																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	95	-	-	-	2	-	-	-	-	-	2	-	-	-	40		2	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	88	15	-	-	1	-	-	-	-	-	16	-	-	-	1066		16	
	95	2	-	-	1	-	-	-	-	-	3	-	-	-	60		3	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	88	53	8	3	2	-	-	-	-	-	66	-	-	-	4400	5	6	
	95	95	-	-	29	-	-	-	-	-	124	-	-	-	2480	6	12	
	00	92	-	-	8	-	-	-	-	-	100	-	-	-	2000	5	8	
D	88	-	1	1	-	-	-	-	-	-	2	-	-	-	133		2	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	2	-	-	-	-	-	-	-	-	1	-	-	1	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		11%			05%			00%			-55%							
'95		00%			00%			00%			-19%							
'00		00%			00%			.97%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	5599	Dec:	2%			
												'95	2540		0%			
												'00	2060		2%			
Gutierrezia sarothrae																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	6	0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'95	0		-			
												'00	0		-			
Pediocactus simpsonii																		
Y	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66	3	4	
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	132	Dec:	-			
												'95	0		-			
												'00	0		-			



A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Purshia tridentata																		
M	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	4	9	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%										
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	0	Dec:	-			
												'95	0		-			
												'00	0		-			
Symphoricarpos oreophilus																		
S	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	88	5	-	-	-	-	-	-	-	-	5	-	-	-	333			5
	95	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
M	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66	9	15	1
	95	-	-	-	7	-	-	-	-	-	7	-	-	-	140	9	32	7
	00	10	-	-	-	-	-	1	-	-	11	-	-	-	220	7	19	11
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%			-40%							
'95		00%			00%			00%			+20%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	399	Dec:	-			
												'95	240		-			
												'00	300		-			
Tetradymia canescens																		
M	88	4	-	-	-	-	-	-	-	-	4	-	-	-	266	6	7	4
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	8	12	1
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40	9	12	2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'88		00%			00%			00%			-92%							
'95		00%			00%			00%			+50%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'88	266	Dec:	-			
												'95	20		-			
												'00	40		-			

### Trend Study 8B-9-00

Study site name: West Goslin .

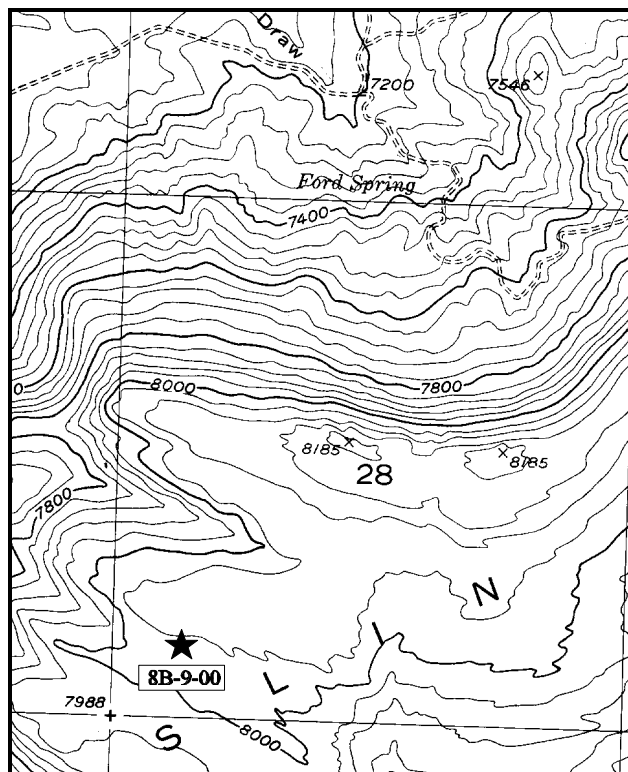
Range type: Big Sagebrush-Grass .

Compass bearing: frequency baseline 264°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

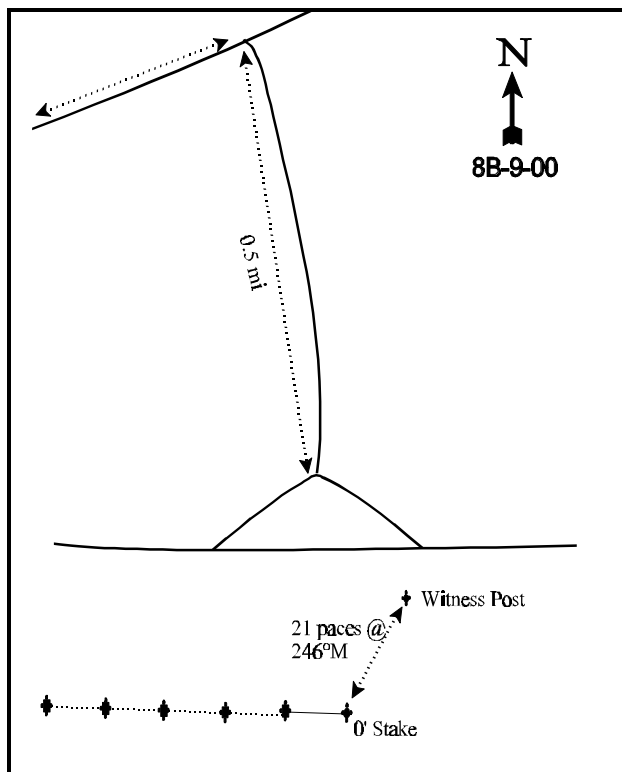
### LOCATION DESCRIPTION

From Dutch John, proceed north towards Antelope Flat on Highway U.S. 191 for approximately 8 miles. Before the Wyoming border, turn east on the Antelope Flat Road towards Goslin Mountain. Go 2.8 miles and turn right towards Goslin Mountain. Turn right and drive 1.3 miles to a gate. Go through the gate and continue 2.5 miles to a fork. Go right 0.5 miles to a intersection. The witness post is located on the east side of the Y shaped intersection about 50' south of the road. Full size posts are used to mark the site. The 0-foot post is marked with a browse tag # 34.



Map Name: Goslin Mtn.

Township 3N , Range 23E ,Section 28



Diagrammatic Sketch

UTM 4535540.855 N, 640174.418 E

## DISCUSSION

### Trend Study No. 8B-9 (9-20)

Five new study sites were established in 1995 in the Goslin Mountain area to monitor key habitat used by both livestock and elk. The area is used for livestock during the summer. Two of the sites were placed in the mountain big sagebrush-grass type and the remaining three monitor meadows which receive concentrated use. This particular site, West Goslin, was placed on a ridge top at an elevation of 8,000 feet with a south-east aspect and gently slope (2% to 3%). An elk herd of about 30 individuals was encountered when setting up the study in early July of 1995. Elk pellet groups were found in 7% of the quadrats placed on the site in 1995, while deer pellet-groups were less common. A few cattle pats were also scattered through the area in small numbers, but none were encountered within a quadrat. Pellet group data from 2000 estimated 30 elk, 7 deer, and 4 cow days use/acre (104 edu/ha, 17 ddu/ha and 10 cdu/ha). Most of the deer and elk pellet groups were from spring use. All cattle pats were from last fall. Cows use this area for one month with 400 AUMs in June, July or August.

The soil is moderately deep and rocky. Effective rooting depth is restricted in some places as evidenced by the presence of black sagebrush. Average effective rooting depth on the site is estimated at nearly 14 inches. Soil texture is a sandy loam with a slightly acidic soil reaction (pH of 6.1). The surface soil horizon, down to about 4 to 5 inches, is relatively rock free with large gravel and rocks common further down. There are also a few large boulders on the soil surface. Phosphorus is limited at only 4.7 ppm where values less than 10 ppm can limit normal plant growth and development. Due to the abundant vegetation and litter cover, there is little bare ground exposed. Vegetation and litter cover are also very well dispersed (as indicated by the very high nested frequency values) further protecting the soil from erosion.

The key browse species on the site consists of a fairly dense stand of mountain big sagebrush. Total cover of sagebrush was almost 25% in 1995 and 24% in 2000. These relatively large sagebrush account for over 70% of the browse cover. Population density was estimated at 3,380 plants/acre in 1995 with 80% of the population consisting of large mature plants. Density in 2000 was estimated at 3,600 plants/acre. Use is mostly light but percent decadence has risen from 14% to 29%. Vigor is normal on most plants but some of the older mature sagebrush appeared chlorotic with 25% of the decadent plants classified as dying (vigor class 4). Reproduction is good however, with a biotic potential (# of seedlings) of 6% and 7% of the population consisting of young plants.

Other less abundant preferred species include a few scattered serviceberry and true mountain mahogany which are more heavily utilized than sagebrush. Additional browse species include a small number of black sagebrush, bitterbrush, and snowberry.

Due to the high elevation of this site (8,000 feet) and the apparent spring use by big game, the herbaceous understory is the key component on this site. The understory is diverse and abundant. Grasses and forbs combine to produce about 30% cover or nearly half of the vegetative cover. Several species are common but letterman needlegrass, mutton bluegrass, and onion grass are the most abundant.

Thirty-one species of forbs were encountered on the site in 1995 and on 23 in 2000 with drought. Silvery lupine is the dominate forb. It provided nearly 7% cover in both 1995 and 2000. Lupine currently ('00) accounts for 54% of the forb cover. Other common forbs include: sulfur eriogonum, desert and longleaf phlox and hollyleaf clover. Preferred forbs include arrowleaf balsamroot, yellow Indian paintbrush, low penstemon, lambstongue and bluebell.

## 1995 APPARENT TREND ASSESSMENT

Due to the abundant vegetation and litter cover, little bare ground is found on the site. The high nested frequency values for vegetation and litter also suggest well dispersed cover. This, combined with the gentle terrain, limits erosion. Trend for soil appears stable at this time. The browse trend is stable. The population of mountain big sagebrush is healthy and vigorous with low numbers of seedlings and a moderate density of young to maintain the population. Percent decadence is moderately low at 14% and use is mostly light to moderate. The one negative aspect of the population is that one in seven plants are dead and 30% of the decadent plants are classified as dying. The herbaceous understory is abundant and diverse. There are several known increaser species on the site including Kentucky bluegrass, Columbia needlegrass, and letterman needlegrass. Combined, these species makeup only 40% of the grass cover with the more preferred grasses accounting for 60%. The forb component also contains some increaser species but the overall composition is good. Trend for grasses and forbs appears stable.

## 2000 TREND ASSESSMENT

Trend for soil is stable. There is abundant and well dispersed protective ground cover to prevent significant erosion. Trend for the key browse species, mountain big sagebrush, is also stable. Population density has remained similar and use is mostly light. Seedlings and young are moderately abundant but decadent plants have increased to 29% of the population. Drought conditions appear to be effecting the sagebrush, even at this elevation. About 3% of the mature plants were classified as chlorotic while 25% of the decadent sagebrush were classified as dying. However, there appears to be adequate seedling and young recruitment to maintain the population. Trend for the herbaceous understory is down slightly. Sum of nested frequency of perennial grasses has declined slightly while frequency of perennial forbs declined substantially.

### TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - down slightly (2)

HERBACEOUS TRENDS --  
Herd unit 08B, Study no: 9

Type	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'95	'00	'95	'00	'95	'00
G	Agropyron dasystachyum	180	*116	55	45	.80	.96
G	Carex spp.	39	33	14	15	.56	.99
G	Dactylis glomerata	49	*-	13	-	.31	-
G	Festuca ovina	26	*17	12	7	.35	.28
G	Melica bulbosa	213	*80	60	32	4.51	1.95
G	Poa compressa	15	*-	7	-	.13	-
G	Poa fendleriana	43	*188	16	55	.86	3.37
G	Poa pratensis	13	*50	3	13	.06	1.43
G	Sitanion hystrix	28	34	13	14	.16	.61
G	Stipa columbiana	96	72	30	25	1.70	1.35
G	Stipa comata	16	*66	6	24	.13	1.90
G	Stipa lettermani	174	141	55	44	3.47	4.26
Total for Annual Grasses		0	0	0	0	0	0
Total for Perennial Grasses		892	797	284	274	13.07	17.13
Total for Grasses		892	797	284	274	13.07	17.13
F	Agoseris glauca	151	*9	56	4	.90	.19
F	Allium spp.	86	*13	41	5	.42	.02
F	Antennaria rosea	4	-	1	-	.03	-
F	Arenaria congesta	16	16	6	8	.51	.11
F	Arabis drummondi	9	6	4	3	.02	.01
F	Astragalus convallarius	4	8	2	4	.18	.24
F	Astragalus spp.	8	4	2	1	.01	.15
F	Balsamorhiza sagittata	4	3	2	2	.01	.04
F	Castilleja flava	4	8	2	3	.03	.04
F	Collomia linearis (a)	169	*3	61	1	1.07	.00
F	Collinsia parviflora (a)	154	*5	49	2	.99	.01
F	Crepis acuminata	36	*8	14	4	.34	.07
F	Cymopterus longipes	11	16	5	7	.07	.06
F	Delphinium nuttallianum	18	*-	8	-	.04	-
F	Draba spp. (a)	2	-	1	-	.03	-
F	Erigeron eatonii	11	5	4	3	.02	.04
F	Eriogonum umbellatum	52	59	19	24	1.31	1.56
F	Heterotheca villosa	3	9	1	3	.00	.21
F	Hymenoxys spp.	2	-	1	-	.03	-
F	Lomatium triternatum	9	*-	3	-	.01	-
F	Lupinus argenteus	197	184	69	70	6.85	6.93

T y p e	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'95	'00	'95	'00	'95	'00
F	Mertensia fusiformis	3	-	1	-	.00	-
F	Penstemon humilis	9	*-	4	-	.04	-
F	Phlox austromontana	27	36	10	13	.56	1.34
F	Phlox longifolia	129	*47	51	19	1.36	.41
F	Polygonum douglasii (a)	69	*27	28	9	.19	.26
F	Senecio integerrimus	16	13	7	7	.09	.06
F	Sedum lanceolatum	9	11	3	3	.06	.09
F	Taraxacum officinale	58	*3	23	1	.21	.03
F	Trifolium gymnocarpon	75	59	29	22	.73	.96
F	Unknown forb-annual (a)	3	-	1	-	.00	-
Total for Annual Forbs		397	35	140	12	2.29	0.28
Total for Perennial Forbs		951	517	368	206	13.90	12.60
Total for Forbs		1348	552	508	218	16.19	12.88

\* Indicates significant difference at % = 0.10

#### BROWSE TRENDS --

Herd unit 08B, Study no: 9

T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Amelanchier utahensis	7	4	.21	.18
B	Artemisia nova	4	0	.00	-
B	Artemisia tridentata vaseyana	82	87	24.90	23.68
B	Chrysothamnus viscidiflorus viscidiflorus	7	8	.53	.21
B	Eriogonum heracleoides	67	65	7.47	7.94
B	Gutierrezia sarothrae	2	0	.15	-
B	Purshia tridentata	1	1	-	.03
B	Symphoricarpos oreophilus	9	10	.96	1.19
Total for Browse		179	175	34.23	33.23

BASIC COVER --

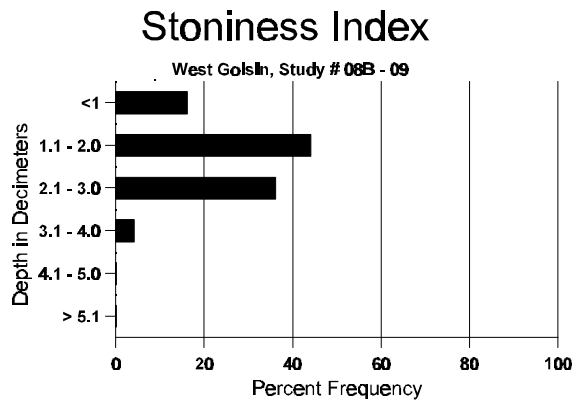
Herd unit 08B, Study no: 9

Cover Type	Nested Frequency		Average Cover %	
	'95	'00	'95	'00
Vegetation	474	459	55.49	61.42
Rock	112	63	1.75	1.41
Pavement	52	79	.12	1.22
Litter	495	492	61.50	70.24
Cryptogams	22	1	.07	.00
Bare Ground	211	143	8.76	6.59

SOIL ANALYSIS DATA --

Herd Unit 8B, Study # 9, Study Name: West Goslin

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
13.48	59.4 (14.09)	6.1	64.0	21.4	14.6	3.0	4.7	134.4	0.6



PELLET GROUP FREQUENCY --

Herd unit 08B, Study no: 9

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre '00	Days Use per Acre (ha) '00
Rabbit	-	3	26	N/A
Elk	7	7	392	30 (74)
Deer	3	4	87	7 (17)
Cattle	-	5	52	4 (11)

## BROWSE CHARACTERISTICS --

Herd unit 08B, Study no: 9

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches)		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4		Ht.	Cr.	
Amelanchier utahensis																		
Y	95	2	1	-	-	-	-	-	-	-	3	-	-	-	60		3	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	95	6	1	-	-	1	1	-	-	-	9	-	-	-	180	27	41	
	00	-	-	1	1	1	1	-	-	-	4	-	-	-	80	27	33	
D	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		23%			08%			00%			-69%							
'00		25%			50%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'95	260	Dec:	8%			
												'00	80		0%			
Artemisia nova																		
M	95	-	2	1	-	-	-	-	-	-	3	-	-	-	60	6	9	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
D	95	-	-	1	-	-	-	-	-	-	-	-	-	1	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		50%			50%			25%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'95	80	Dec:	25%			
												'00	0		0%			
Artemisia tridentata vaseyana																		
S	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	10	-	-	-	-	-	-	-	-	10	-	-	-	200		10	
Y	95	11	-	-	-	-	-	-	-	-	11	-	-	-	220		11	
	00	12	-	-	-	-	-	-	-	-	12	-	-	-	240		12	
M	95	92	39	4	-	-	-	-	-	-	135	-	-	-	2700	30	43	
	00	107	7	1	1	-	-	-	-	-	113	-	3	-	2320	28	43	
D	95	19	3	-	1	-	-	-	-	-	16	-	-	7	460		23	
	00	45	6	1	-	-	-	-	-	-	39	-	-	13	1040		52	
X	95	-	-	-	-	-	-	-	-	-	-	-	-	-	480		24	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	660		33	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		25%			02%			04%			+ 6%							
'00		07%			01%			09%										
Total Plants/Acre (excluding Dead & Seedlings)												'95	3380	Dec:	14%			
												'00	3600		29%			



A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Cercocarpus montanus																		
M	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	68	84	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)														'95	0	Dec:	-	
														'00	0		-	
Chrysothamnus viscidiflorus viscidiflorus																		
Y	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3	
M	95	9	-	-	-	-	-	-	-	-	9	-	-	-	180	8	12	
	00	9	-	-	-	-	-	-	-	-	9	-	-	-	180	9	14	
D	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		00%			00%			00%			+23%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)														'95	200	Dec:	0%	
														'00	260		8%	
Eriogonum heracleoides																		
Y	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	00	56	-	-	-	-	-	-	-	-	56	-	-	-	1120		56	
M	95	242	-	-	28	-	-	-	-	-	270	-	-	-	5400	11	14	
	00	252	-	-	-	-	10	-	-	-	262	-	-	-	5240	4	10	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		00%			00%			00%			+14%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)														'95	5440	Dec:	-	
														'00	6360		-	
Gutierrezia sarothrae																		
M	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40	6	7	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)														'95	40	Dec:	-	
														'00	0		-	

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Purshia tridentata																		
M	95	-	-	-	-	-	1	-	-	-	1	-	-	-	20	15	42	1
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60	16	28	3
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		00%			100%			00%			+67%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)														'95	20	Dec:	-	
														'00	60		-	
Symphoricarpos oreophilus																		
Y	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	95	7	7	-	3	-	-	-	-	-	17	-	-	-	340	24	47	17
	00	12	-	-	3	-	-	-	-	-	15	-	-	-	300	25	53	15
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		41%			00%			00%			- 6%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)														'95	340	Dec:	-	
														'00	320		-	

### Trend Study 8B-10-00

Study site name: Sagebrush Ridge.

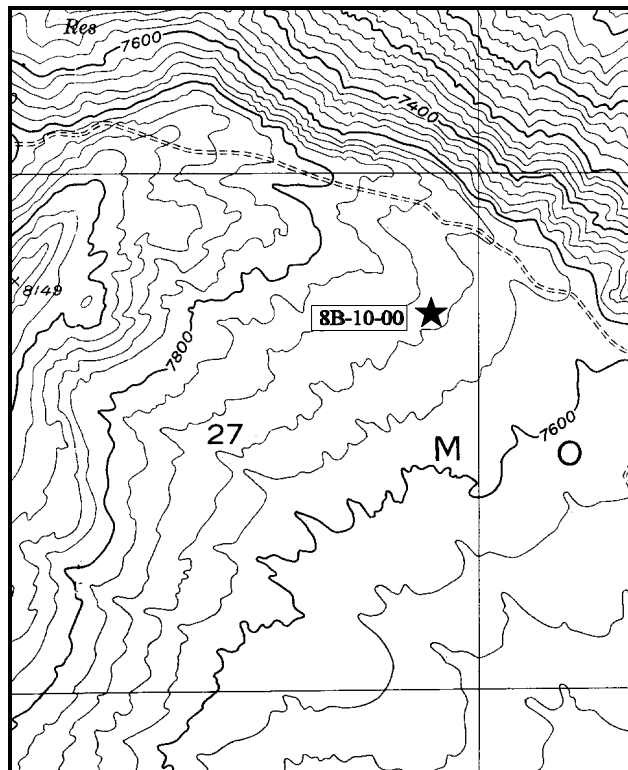
Range type: Big Sagebrush-Grass.

Compass bearing: frequency baseline 242°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

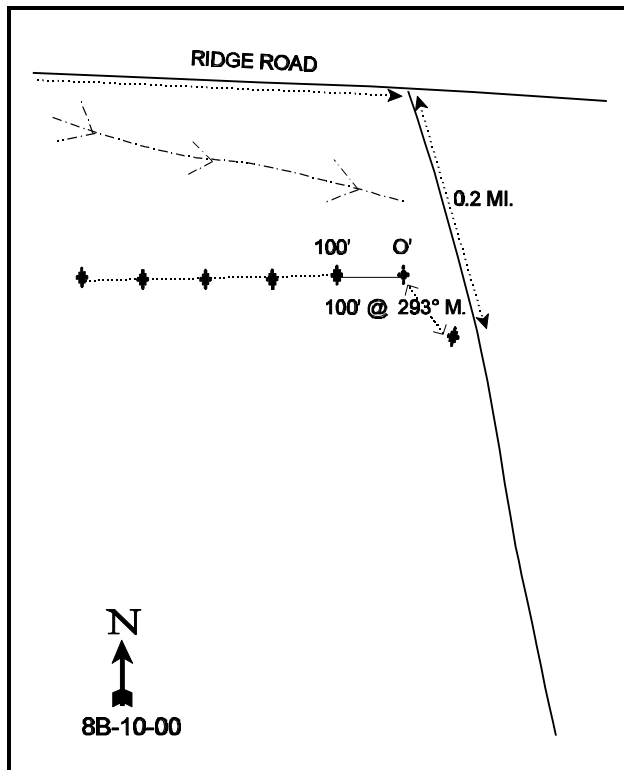
### LOCATION DESCRIPTION

From Dutch John, proceed north towards Antelope Flat on Highway U.S. 191 for approximately 8 miles. Before the Wyoming border, turn east on the Antelope Flat Road towards Goslin Mountain. Go 2.8 miles and turn right towards Goslin Mountain. Bear right and drive 1.3 miles to a gate. Continue 4.5 miles to a fork. Bear right and drive 0.2 miles. There will be a witness post on the west side of the road. The 0' post is 100 ft away at 293°M. The site is marked with full high fence posts. The 0-foot post is marked with a browse tag # 33.



Map Name: Goslin Mtn.

Township 3N, Range 23E, Section 27



Diagrammatic Sketch

UTM 4536922.294 N, 643044.360 E

## DISCUSSION

### Trend Study No. 8B-10 (9-21)

This trend study, Sagebrush Ridge, also samples a mountain big sagebrush-grass type at an elevation of 7,700 feet with an eastern aspect. Slope is moderate ranging from 5% to 10%. Cattle utilize this area in the summer when not concentrated in the relatively small wet meadows nearby. Deer also use the area in the summer. A few elk pellet-groups were noted yet none were encountered within the quadrats. A pellet group transect read parallel to the study site baseline in 2000 estimate 19 deer, 1 elk, and 1 cow days use/acre (47 ddu/ha, 3 edu/ha and 3 cdu/ha). All cattle pats encountered were from last fall. Livestock graze this area during the summer. They are currently allowed to graze for one month at 400 AUMs. Most of the cattle grazing in this area is concentrated on nearby meadows. Sage grouse also use the area and 10 adult birds, many with young, were seen near the site during the 2000 reading.

The soil is moderately shallow and rocky but rooting depth does not appear to be a limiting factor. Effective rooting depth is estimated at only 11 inches due to a calcified hardpan and bedrock in some areas. It has a sandy loam texture with a neutral pH. Phosphorus is limited at 7.8 ppm where values less than 10 ppm can limit normal plant growth and development. Percent bare ground is higher on this site than at West Goslin (8B-9), but it is still relatively low at 11% in 1995 and 12% in 2000. The abundant and well dispersed vegetation and litter cover adequately protect the soil from erosion.

The dominant browse on this site is mountain big sagebrush which provides about 75% of the total browse cover. In 1995, density was estimated at 3,580 plants/acre, 76% of which were mature. Use was moderate to heavy, but vigor was normal on most plants with percent decadence at only 18%. Dead plants were common. However, it appears that winter injury and snow mold is responsible for most of the decadence and some of the dead plants on the site. Several areas nearby, especially those with more northern aspects, contain pockets of dead sagebrush due to deep snow accumulation from the winter of 1992-93. During the 2000 reading, population density was estimated at 4,220 plants/acre. Use is mostly light but due to drought, vigor is poor on 22% of the plants sampled. In addition, percent decadence has increased to 28% with 23% of the decadent sagebrush classified as dying. On the positive side, young plants are numerous and represent 19% of the population.

Bitterbrush is another important browse species on the site. There was an estimated 760 plants/acre in 1995. Utilization was reported moderate to heavy with 53% of the shrubs displaying heavy use (>60% stems browsed). Even with this heavy use some bitterbrush were in flower. Vigor was good on most plants and percent decadence was low at 3%. During the 2000 reading, density was estimated at 680 plants/acre. Use is lighter with only 15% of the shrubs sampled being heavily browsed. Vigor remains good and percent decadence is low. Other less desirable browse encountered on the site include mountain low rabbitbrush, wyeth eriogonum, slenderbush eriogonum, and gray horsebrush.

The Herbaceous understory is abundant and diverse with a composition that is very similar to West Goslin (8B-9). Eleven perennial grasses and one sedge currently ('00) produce 26% cover which accounts for 40% of the total vegetation cover. Dominant species include: Carex, needle-and-thread, letterman needlegrass, mutton bluegrass and thickspike wheatgrass. Forbs are also abundant and diverse which include several preferred species including: pale agoseris, sulfur eriogonum, silvery lupine, bluebells, low penstemon and lambstongue. These forbs currently ('00) provide 65% of the forb cover and offer excellent spring forage for deer and elk.

### 1995 APPARENT TREND ASSESSMENT

Estimated cover for bare ground is only 11% with abundant vegetation and litter cover. This cover is also well dispersed, adequately protecting the soil from erosion. Trend for soil appears stable. The browse trend appears to be slightly down with a moderately high proportion of the decadent plants that are dying. The high number of dead plants encountered is evidence of a reduction in density in the past, either by unusually heavy snow cover during the 1992-93 and the 1994-95 winters, or winter injury coupled with drought. Currently the population appears healthy, utilization is mostly light to moderate with percent decadency moderately low at 17%. The herbaceous understory contains a large variety of grasses and forbs. Of the 12 species of grasses and one sedge encountered, most are desirable forage species. The forb component also contains several desirable species. The herbaceous understory appears in relatively good condition.

### 2000 TREND ASSESSMENT

Trend for soil is stable with abundant and well dispersed vegetation and litter cover. Trend for mountain big sagebrush is mixed. Use is lighter compared to 1995 but percent decadence has increased from 18% to 28% with 22% of the sampled sagebrush displaying poor vigor due to drought. In addition, 23% of the decadent sagebrush were classified as dying. On the positive side, young recruitment is improved with young plants accounting for 19% of the population. The less abundant but preferred bitterbrush, shows less heavy use. Vigor is good and percent decadence low at 6%. Taking all of these factors into consideration, trend for browse is considered stable. Drought conditions are obviously effecting the health of the sagebrush but a return to normal precipitation patterns will improve this. Trend for the herbaceous understory is down slightly. Sum of nested frequency of perennial grasses declined slightly while frequency of perennial forbs declined more substantially. Due to the dry conditions, nested frequency of annual forbs declined by 54%.

#### TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - down slightly (2) especially for forbs

HERBACEOUS TRENDS --  
Herd unit 08B, Study no: 10

T y p e	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'95	'00	'95	'00	'95	'00
G	Agropyron dasystachyum	186	*135	57	46	2.15	1.35
G	Carex spp.	177	185	58	68	5.86	7.49
G	Festuca ovina	43	58	14	20	1.47	1.39
G	Koeleria cristata	6	1	2	1	.01	.03
G	Melica bulbosa	13	10	4	3	.24	.06
G	Muhlenbergia richardsonis	5	-	2	-	.06	-
G	Poa compressa	96	*38	33	14	.64	.94
G	Poa fendleriana	2	*112	1	39	.03	2.22
G	Poa pratensis	8	6	3	2	.04	.15
G	Sitanion hystrix	57	36	24	16	.45	.31
G	Stipa columbiana	19	16	9	5	.42	.39
G	Stipa comata	188	145	60	42	3.63	5.78
G	Stipa lettermani	95	118	29	33	2.32	6.04
Total for Annual Grasses		0	0	0	0	0	0
Total for Perennial Grasses		895	860	296	289	17.35	26.19
Total for Grasses		895	860	296	289	17.35	26.19
F	Agoseris glauca	181	*71	68	34	1.12	.78
F	Antennaria dimorpha	2	-	1	-	.03	-
F	Antennaria rosea	12	13	5	5	.07	.22
F	Arenaria congesta	6	10	2	4	.18	.31
F	Arabis drummondi	3	*17	2	7	.01	.06
F	Astragalus convallarius	26	19	13	9	.72	.39
F	Astragalus spp.	-	1	-	1	-	.03
F	Calochortus nuttallii	3	-	1	-	.00	-
F	Collomia linearis (a)	198	*1	75	1	1.58	.00
F	Collinsia parviflora (a)	193	*43	60	14	1.64	.07
F	Cryptantha spp.	8	2	3	2	.01	.01
F	Cymopterus longipes	48	*36	26	16	.40	.21
F	Delphinium nuttallianum	8	7	4	2	.02	.01
F	Erigeron eatonii	22	27	11	12	.28	.19
F	Eriogonum umbellatum	38	40	14	15	1.29	2.29
F	Gayophytum ramosissimum (a)	9	*-	3	-	.01	-
F	Lithospermum ruderales	29	36	12	14	.62	1.00
F	Lomatium triternatum	3	4	1	2	.00	.06
F	Lupinus argenteus	135	123	59	55	3.95	3.00
F	Mertensi fusiformis	56	50	25	22	.71	1.46

T y p e	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'95	'00	'95	'00	'95	'00
F	Penstemon humilis	42	*8	18	3	.29	.04
F	Phlox longifolia	172	154	62	58	.79	.91
F	Polygonum douglasii (a)	105	*30	40	11	.25	.05
F	Senecio integerrimus	6	8	6	4	.11	.09
F	Stellaria longipes	5	*-	3	-	.04	-
F	Taraxacum officinale	-	2	-	1	-	.00
F	Tragopogon dubius	9	1	3	1	.01	.00
F	Trifolium gymnocarpon	47	33	21	17	.28	.52
F	Unknown forb-annual (a)	1	-	1	-	.00	-
Total for Annual Forbs		506	74	179	26	3.50	0.12
Total for Perennial Forbs		861	662	360	284	10.99	11.62
Total for Forbs		1367	736	539	310	14.49	11.75

\* Indicates significant difference at % = 0.10

#### BROWSE TRENDS --

Herd unit 08B, Study no: 10

T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia tridentata vaseyana	85	82	17.29	20.70
B	Ceratoides lanata	1	0	.00	-
B	Chrysothamnus viscidiflorus viscidiflorus	2	3	.03	.03
B	Eriogonum heracleoides	28	30	1.86	1.55
B	Eriogonum microthecum	27	30	.97	.44
B	Purshia tridentata	29	30	2.84	5.14
B	Tetradymia canescens	0	1	-	.03
Total for Browse		172	176	23.01	27.90

BASIC COVER --

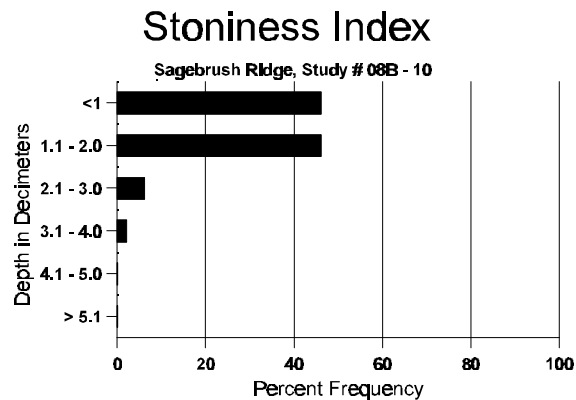
Herd unit 08B, Study no: 10

Cover Type	Nested Frequency		Average Cover %	
	'95	'00	'95	'00
Vegetation	469	463	50.19	63.35
Rock	105	28	.51	.25
Pavement	221	205	1.72	5.55
Litter	497	475	54.46	63.60
Cryptogams	2	4	.00	.18
Bare Ground	306	210	11.05	12.05

SOIL ANALYSIS DATA --

Herd Unit 8B, Study # 10, Study Name: Sagebrush Ridge

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
11.18	51.2 (13.07)	6.6	71.0	14.1	14.9	3.0	7.8	150.4	0.6



PELLET GROUP FREQUENCY --

Herd unit 08B, Study no: 10

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre '00	Days Use per Acre (ha) '00
Rabbit	2	-	96	N/A
Elk	-	-	17	1 (3)
Sage Grouse	-	1	78	N/A
Deer	6	1	252	19 (48)
Cattle	8	4	17	2 (4)



## BROWSE CHARACTERISTICS --

Herd unit 08B, Study no: 10

Treatment Unit 66B, Study No. 16																			
A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches)		Total	
		1	2	3	4	5	6	7	8	9	1	2	3	4		Ht.	Cr.		
S	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1		
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3		
Y	95	4	6	1	-	-	-	-	-	-	11	-	-	-	220		11		
	00	41	-	-	-	-	-	-	-	-	41	-	-	-	820		41		
M	95	45	86	5	-	-	-	-	-	-	136	-	-	-	2720	25	39	136	
	00	86	10	-	14	-	-	-	-	-	86	-	24	-	2200	23	36	110	
D	95	4	16	12	-	-	-	-	-	-	24	-	2	6	640		32		
	00	54	4	-	2	-	-	-	-	-	36	1	9	14	1200		60		
X	95	-	-	-	-	-	-	-	-	-	-	-	-	-	920		46		
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	740		37		
% Plants Showing																			
		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>								
'95		60%			10%			04%			+15%								
'00		07%			00%			22%											
Total Plants/Acre (excluding Dead & Seedlings)														'95	3580	Dec:	18%		
														'00	4220		28%		
Ceratoides lanata																			
M	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	6	9	1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
% Plants Showing																			
		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>								
'95		00%			00%			00%											
'00		00%			00%			00%											
Total Plants/Acre (excluding Dead & Seedlings)														'95	20	Dec:	-		
														'00	0		-		
Chrysothamnus viscidiflorus viscidiflorus																			
M	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40	12	17	2	
	00	3	-	-	-	-	-	-	-	-	3	-	-	-	60	12	17	3	
D	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1	
% Plants Showing																			
		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>								
'95		00%			00%			00%			+50%								
'00		00%			00%			00%											
Total Plants/Acre (excluding Dead & Seedlings)														'95	40	Dec:	0%		
														'00	80		25%		

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Eriogonum heracleoides																		
Y	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	13	-	-	-	-	-	-	-	-	-	-	-	-	260		13	
M	95	68	-	-	-	-	-	-	-	-	68	-	-	-	1360	11	19	
	00	66	-	-	-	-	-	-	-	-	66	-	-	-	1320	4	10	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		00%			00%			00%			+14%							
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'95	1360	Dec:	-			
												'00	1580		-			
Eriogonum microthecum																		
S	95	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	95	8	-	-	-	-	-	-	-	-	8	-	-	-	160		8	
	00	5	-	-	-	-	-	6	-	-	11	-	-	-	220		11	
M	95	49	-	-	5	2	-	-	-	-	56	-	-	-	1120	7	12	
	00	33	-	-	8	-	-	-	-	-	39	1	1	-	820	6	7	
D	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		03%			00%			00%			-17%							
'00		00%			00%			02%										
Total Plants/Acre (excluding Dead & Seedlings)												'95	1280	Dec:	0%			
												'00	1060		2%			
Gutierrezia sarothrae																		
M	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	11	16	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'95	0	Dec:	-			
												'00	0		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Purshia tridentata																		
S	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	00	4	-	-	1	-	-	-	-	-	5	-	-	-	100		5	
M	95	3	7	13	-	5	7	-	-	-	35	-	-	-	700	16 36	35	
	00	9	7	1	2	4	3	1	-	-	27	-	-	-	540	19 47	27	
D	95	-	1	-	-	-	-	-	-	-	-	-	-	1	20		1	
	00	1	-	1	-	-	-	-	-	-	2	-	-	-	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		34%			53%			03%			-11%							
'00		32%			15%			00%										
Total Plants/Acre (excluding Dead & Seedlings)														'95	760	Dec:	3%	
														'00	680		6%	
Tetradymia canescens																		
M	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	9 10	0	
	00	-	-	-	1	-	-	-	-	-	1	-	-	-	20	8 14	1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'95		00%			00%			00%										
'00		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)														'95	0	Dec:	-	
														'00	20		-	

### Trend Study 8B-11-00

Study site name: Triangle Meadow .

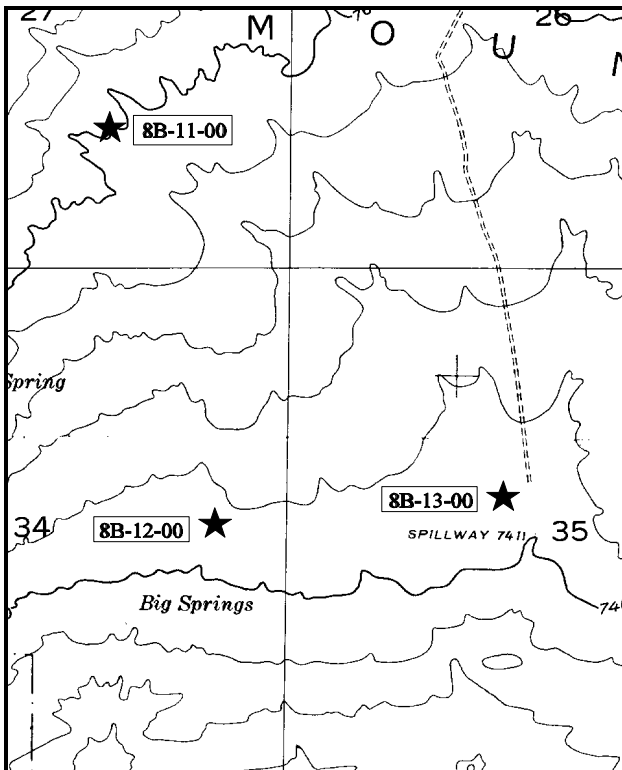
Range type: Dry Meadow .

Compass bearing: frequency baseline 95°M .

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

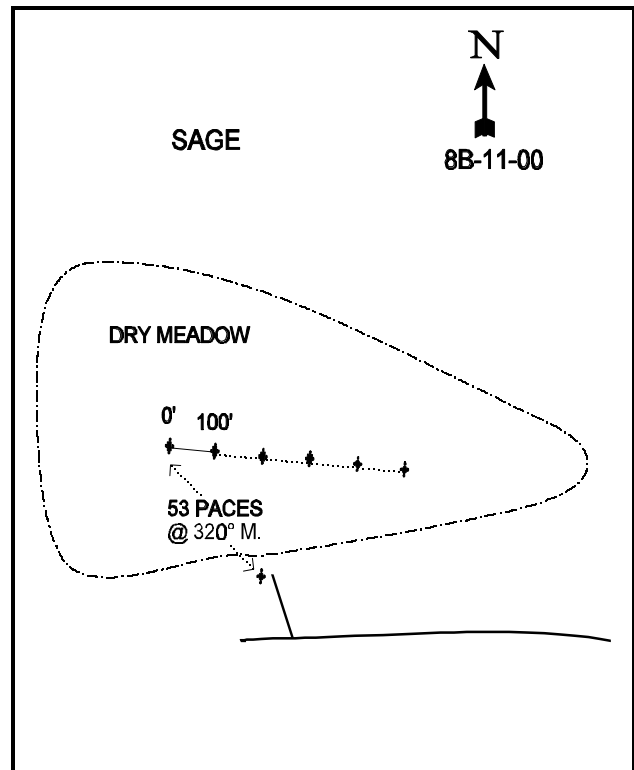
### LOCATION DESCRIPTION

From Dutch John, proceed north towards Antelope Flat on Highway U.S. 191 for approximately 8 miles. Before the Wyoming border, turn east on the Antelope Flat Road towards Goslin Mountain. Go 2.8 miles and turn right towards Goslin Mountain. Bear right and drive 1.3 miles to a gate. Continue 4.5 miles to a fork. Bear right and proceed 0.8 miles passing study 8B-10-00 to a four-way intersection. Turn right and drive 0.4 miles to a fork by a meadow. Turn right and continue 0.1 miles to a meadow with a witness post. The 0-foot baseline stake is located 53 paces away at 320°M.



Map Name: Goslin Mtn.

Township 3N , Range 23E ,Section 27



Diagrammatic Sketch

UTM 4536054.932 N, 642562.193 E

## DISCUSSION

### Trend Study No. 8B-11 (9-22)

This study site, Triangle Meadow, was placed in a meadow less than one-half of a mile south of study #10. This meadow, which is on DWR land, receives light to moderate use by elk and deer with heavy use during the summer by cattle. The study was established in early July of 1995 before livestock were allowed onto the allotment. Elk were seen on the site and appear to use the area mostly in the spring and fall. Cattle use was heavy during the summer of 1994 as evidenced by the high quadrat frequency of cow pats in 1995 (see pellet group table). Pellet group data taken along the study site baseline in 2000, estimates only light wildlife use. Cattle use from the previous season (1999) was estimated at 49 cow days use/acre (121 cdu/ha). Several spring antelope pellet groups were also encountered and an antelope fawn was on the meadow during the 2000 reading. In addition, a bull moose was seen near the site and several sage grouse were observed in the area.

Slope on the meadow is nearly level (2% to 5%) with drainage to the east. This meadow was partially flooded when the site was established in 1995. The meadow appears to be sub-irrigated most of the summer by springs originating from the hillside a short distance to the west. During the 2000 reading, the meadow was very dry. No water was visible and the soil profile was extremely dry and compact.

The soil appears to be deep and relatively rock free. However, due to the dry conditions of 2000, the soil was very dry and compacted. Effective rooting depth was estimated at only 7 inches due to a hard compacted clay horizon which was encountered at about 4 inches in depth. Soil texture is a sandy loam with a neutral soil reaction (pH of 6.6). Erosion is not a problem on these meadows due to the extensive ground cover of sod forming grasses.

Very few browse occur on these meadows. The only species encountered on this site was a seedling and one young mountain big sagebrush in 1995. The high water table during most of the spring prohibits sagebrush from becoming established.

The important aspect of these meadows is the herbaceous species, especially the grasses which provide forage for wildlife and livestock. The grasses produced a total of 39% cover in 1995, increasing to 66% in 2000. Kentucky bluegrass, an increaser, was the most numerous species in 1995, accounting for 74% of the grass cover. Baltic rush, a less desirable species, was also common producing 11% of the grass cover. In 2000, nested frequency of Baltic rush increased significantly and cover rose five-fold from 5% to 26%. Kentucky bluegrass declined significantly in nested frequency while cover declined slightly from 29% to 25%. The key forage species on this meadow is Nebraska sedge which provided 13% of the grass cover in 1995, increasing to 22% by 2000. This sedge is highly palatable and a good indicator species.

Forbs provided a total cover value of 6% in 1995, and only 1% in 2000. The most common species is dandelion, an invasive plant, which accounted for 78% of the forb cover in 1995 and 96% in 2000. Most of the other forbs are annuals or low growing perennials.

### 1995 APPARENT TREND ASSESSMENT

Soil trend appears stable and there is no threat of erosion on this site as long as the sod cover is not broken. There are very few shrubs on site, but the shrub component is not an important aspect here with regard to transition or summer range. The herbaceous composition is the important aspect of this meadow type. Since there is no previous data to determine trends, vegetative condition will have to be assessed by composition only. The grass component is dominated by Kentucky bluegrass, an increaser under moderate to heavy grazing pressure. The second most abundant species is Nebraska sedge which is a palatable and highly sought after

forage plant. This species decreases with moderate to heavy grazing pressure. Forbs are dominated by dandelion and other low growing perennial and annual species. Trend is not very feasible without at least two sampling periods. However, trend would be considered stable, but in fair to poor condition due to the present species composition.

## 2000 TREND ASSESSMENT

Trend for soil is stable with no exposed bare ground and excellent herbaceous vegetation and litter cover. There are no shrubs on this site and they are not an important component on this spring/fall range. Trend for the herbaceous understory is mixed. Sum of nested frequency of perennial grasses increased slightly while sum of nested frequency of perennial forbs declined. Perennial grass cover has nearly doubled since 1995. Nested frequency for Nebraska sedge, which is the key forage species on this site, increased significantly. In addition, cover of Nebraska sedge has nearly tripled. Nested frequency of the increaser, Kentucky bluegrass, declined significantly since 1995. One negative aspect of the herbaceous trend is that Baltic rush, a low value increaser, increased significantly in frequency with cover increasing five-fold since 1995. The only common forb is dandelion which declined significantly in nested frequency due to a combination of drought and competition with the vigorous perennial grasses. The herbaceous trend is considered stable with the improvement of Nebraska sedge offset by the increase in Baltic rush and decline in perennial forbs. Drought conditions have obviously given the deep rooted Baltic rush and Nebraska sedge a competitive advantage over other perennial species.

### TREND ASSESSMENT

soil - stable (3)

browse - no browse on site (NA)

herbaceous understory - stable, but composition still dominated by increasers (3)

### HERBACEOUS TRENDS --

Herd unit 08B, Study no: 11

Type	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'95	'00	'95	'00	'95	'00
G	Agropyron spp.	7	*-	3	-	.39	-
G	Carex nebraskensis	271	*309	79	82	5.09	14.48
G	Juncus balticus	215	*367	75	94	4.50	26.26
G	Muhlenbergia richardsonis	6	-	2	-	.15	-
G	Poa pratensis	487	*356	100	90	28.99	25.18
G	Sitanion hystrix	1	-	1	-	.03	-
Total for Annual Grasses		0	0	0	0	0	0
Total for Perennial Grasses		987	1032	260	266	39.16	65.93
Total for Grasses		987	1032	260	266	39.16	65.93
F	Achillea millefolium	1	3	1	2	.00	.03
F	Aster spp.	11	*-	5	-	.24	-
F	Astragalus spp.	4	-	2	-	.01	-
F	Chorispora tenella (a)	16	*-	9	-	.07	-
F	Collinsia parviflora (a)	18	*-	7	-	.08	-
F	Descurainia pinnata (a)	2	-	1	-	.00	-
F	Draba spp. (a)	48	*-	18	-	.43	-
F	Gayophytum ramosissimum (a)	10	*-	3	-	.01	-

T y p e	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'95	'00	'95	'00	'95	'00
F	Lappula occidentalis (a)	8	*-	3	-	.39	-
F	Lepidium spp. (a)	2	-	1	-	.00	-
F	Myosotis alpestris	15	*-	6	-	.03	-
F	Polygonum douglasii (a)	4	-	2	-	.01	-
F	Ranunculus testiculatus (a)	1	-	1	-	.00	-
F	Taraxacum officinale	251	*53	88	21	4.67	.97
F	Tragopogon dubius	2	1	1	1	.03	.00
F	Unknown forb-annual (a)	3	-	1	-	.00	-
Total for Annual Forbs		112	0	46	0	1.02	0
Total for Perennial Forbs		284	57	103	24	4.99	1.01
Total for Forbs		396	57	149	24	6.02	1.01

\* Indicates significant difference at % = 0.10

#### BROWSE TRENDS --

Herd unit 08B, Study no: 11

T y p e	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia tridentata vaseyana	-	-	.01	-
Total for Browse		-	-	0.00	0

#### BASIC COVER --

Herd unit 08B, Study no: 11

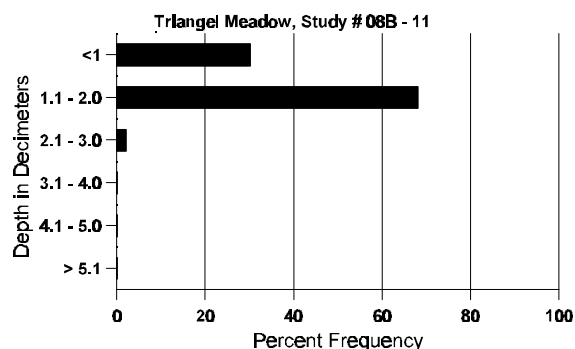
Cover Type	Nested Frequency		Average Cover %	
	'95	'00	'95	'00
Vegetation	494	495	51.43	62.70
Rock	17	-	.05	0
Pavement	36	-	.06	0
Litter	500	499	79.47	89.40
Cryptogams	10	-	.02	0
Bare Ground	58	-	.43	0

#### SOIL ANALYSIS DATA --

Herd Unit 8B, Study # 11, Study Name: Triangle Meadow

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
6.99	50.8 (7.17)	6.6	64.0	19.7	16.3	4.3	15.3	76.8	1.3

## Stoniness Index



## PELLET GROUP FREQUENCY --

Herd unit 08B, Study no: 11

Type	Quadrat Frequency		Pellet Transect	
			Pellet Groups per Acre	Days Use per Acre (ha)
	'95	'00	00	00
Rabbit	2	-	-	-
Elk	7	-	-	-
Deer	8	-	17	1 (3)
Cattle	48	6	583	49 (120)
Antelope	-	-	61	5 (12)

## BROWSE CHARACTERISTICS --

Herd unit 8B, Study no: 11

Field unit 02, Study No. 11																	
A Y G R E	Form Class (No. of Plants)										Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Artemisia tridentata vaseyana																	
S	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
Y	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
		'95			00%			00%			00%						
		'00			00%			00%			00%						
Total Plants/Acre (excluding Dead & Seedlings)														'95	20	Dec:	-
														'00	0		-



Trend Study 8B-12-00

Study site name: Big Meadow.

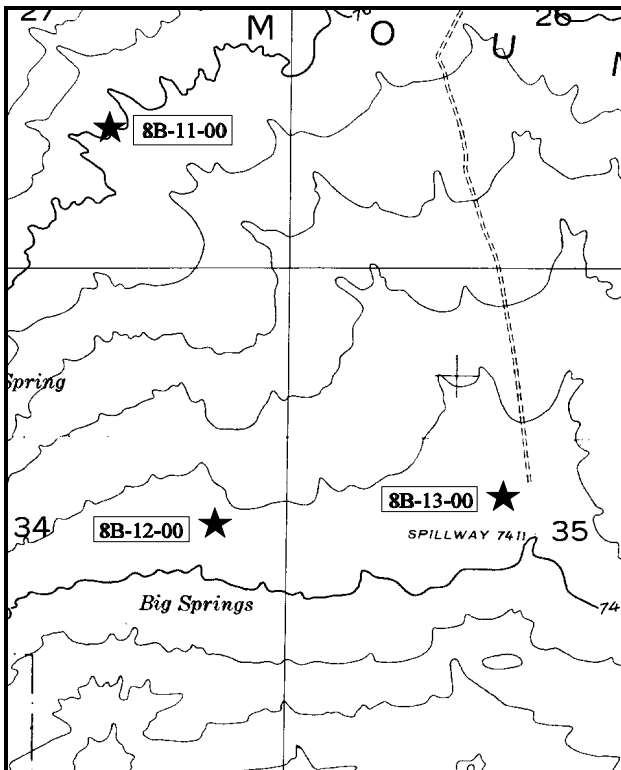
Range type: Wet Meadow.

Compass bearing: frequency baseline 322°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

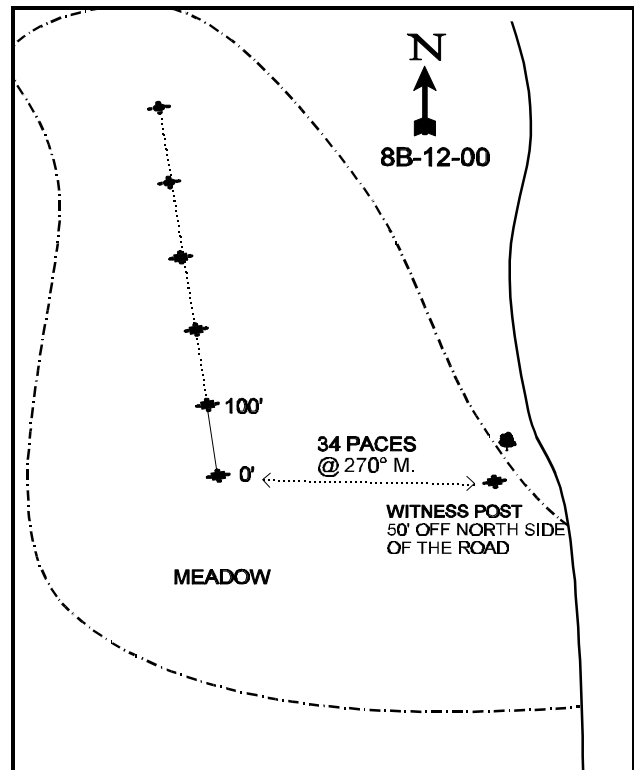
LOCATION DESCRIPTION

From Dutch John, proceed north towards Antelope Flat on Highway U.S. 191 for approximately 8 miles. Before the Wyoming border, turn east on the Antelope Flat Road towards Goslin Mountain. Go 2.8 miles and turn right towards Goslin Mountain. Bear right and drive 1.3 miles to a gate. Continue 4.5 miles to a fork. Bear right and proceed 0.8 miles passing study 8B-10-00 to a four-way intersection. Continue straight west and drive 0.4 miles to a witness post. The witness post is located 50 feet off the north side of the road. From the witness post walk 34 paces at 270°/M. to the 0-foot baseline stake.



Map Name: Goslin Mtn.

Township 3N, Range 23E, Section 34



Diagrammatic Sketch

UTM 4534888.557 N, 643005.736 E

## DISCUSSION

### Trend Study No. 8B-12 (9-23)

The Big Meadow trend study is a another new study set up in the Goslin Mountain area to monitor concentrated use areas by wildlife and livestock on small meadows. This meadow is about one half of a mile south of site #11, just north of Big Springs at an elevation of 7,500 feet. The transect was placed on the north edge of the meadow. Slope is more gradual here than at site #11 resulting in wetter conditions. Drainage is to the east, south-east.

The soil is deep with an effective rooting depth >35 inches. There are no rocks on the surface or within the profile. Soil texture is a clay loam with a mildly alkaline soil reaction (pH of 7.4). Phosphorus is limited at only 5.5 ppm where values less than 10 ppm can limit normal plant growth and development. Vegetation and litter cover are abundant and prohibit any erosion. Water is found on the surface of the meadow until sometime in June or July depending on weather conditions. During study establishment, July 7<sup>th</sup> 1995, the ground was mostly dry although the water table appeared to be just under the surface in most places. Further to the south the meadow becomes increasingly wet with some shallow accumulations of water visible. Due to the wet conditions, deep hoof action by cattle has caused the surface to be uneven in places. There is no erosion occurring due to the abundant herbaceous cover.

Grasses and forbs are diverse and abundant on this site, however species composition could be better. In 1995, nearly 80% of the grass cover came from Baltic rush and Kentucky bluegrass. This increased to 95% by 2000. Both of these species are considered increasers under grazing pressure. The more desirable Nebraska sedge, tufted hair-grass, and slender wheatgrass made up only 13% of the grass cover in 1995 and 25% in 2000.

Dominant forbs include yarrow, Pacific aster, thistle, cinquefoil, balsam groundsel and dandelion. Many of these species are low growing increasers which establish under heavy grazing pressure. Increaser forbs made up 76% of the forb cover in 1995 and 66% in 2000.

### 1995 APPARENT TREND ASSESSMENT

Soil trend is considered stable due to the almost imperceptible slope and excellent vegetation and litter cover. No shrubs occur on the site so there is no data available for a browse trend. Composition of the herbaceous understory is diverse, but dominated by less desirable increaser species. The increaser grass-like and grass species are Baltic rush and Kentucky bluegrass. Forbs are diverse but are also dominated by low growing increasers. Dandelion is the most numerous forb with a quadrat frequency of 96%. Although this forb is found in many natural undisturbed communities, high densities are a good indication of overgrazing.

### 2000 TREND ASSESSMENT

Trend for soil is stable with abundant and well dispersed herbaceous cover and very little bare ground exposed. There are no shrubs on the site so there is no browse trend. Trend for the herbaceous understory is considered down slightly. Sum of nested frequency of perennial grasses has declined slightly with a significant decline in the frequency of Kentucky bluegrass, tufted hair-grass, Carex and slender wheatgrass. The key forage species, Nebraska sedge, increased significantly in frequency and cover rose from 3% in 1995 to 14% in 2000. However, the poor value increaser, Baltic rush, also increased significantly in nested frequency and cover doubled. It now provides 58% of the grass cover. Sum of nested frequency of perennial forbs declined by 56% with some of the most abundant species low valued increasers. The dominant species include: horsetail, cinquefoil, dandelion and hook violet.

# TREND ASSESSMENT

soil - stable (3)

browse - no browse on site (NA)

herbaceous understory - down slightly (2) especially for forbs

## HERBACEOUS TRENDS --

Herd unit 08B, Study no: 12

Type	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'95	'00	'95	'00	'95	'00
G	Agropyron trachycaulum	89	*29	30	11	.74	.15
G	Carex nebraskensis	233	*303	78	89	2.76	14.13
G	Carex spp.	146	*39	39	13	2.86	1.39
G	Deschampsia caespitosa	88	*47	30	18	1.85	.76
G	Hordeum brachyantherum	9	*31	3	12	.01	.31
G	Juncus balticus	410	*444	94	96	16.51	34.60
G	Muhlenbergia richardsonis	16	1	5	1	.07	.00
G	Phleum pratense	-	2	-	1	-	.03
G	Poa pratensis	440	*223	95	67	16.20	8.55
Total for Annual Grasses		0	0	0	0	0	0
Total for Perennial Grasses		1431	1119	374	308	41.02	59.94
Total for Grasses		1431	1119	374	308	41.02	59.94
F	Achillea millefolium	48	*8	14	5	1.43	.10
F	Agoseris glauca	10	3	4	1	.05	.00
F	Antennaria rosea	26	*3	10	2	.91	.03
F	Arabis spp.	3	-	1	-	.00	-
F	Astragalus agrestis	37	*-	11	-	.08	-
F	Aster chilensis	146	*35	48	12	3.13	.91
F	Aster spp.	36	*-	11	-	.59	-
F	Cirsium spp.	95	*-	38	-	1.53	-
F	Equisetum spp.	72	*90	24	27	.33	1.66
F	Erigeron spp.	3	5	1	1	.00	.00
F	Myosotis alpestris	13	*52	4	19	.04	.77
F	Potentilla anersina	200	199	68	78	3.85	5.14
F	Potentilla gracilis	69	*25	32	11	1.56	.44
F	Ranunculus testiculatus (a)	11	*-	3	-	.18	-
F	Senecio pauperculus	97	*-	25	-	2.75	-
F	Sisyrinchium spp.	104	*-	39	-	1.24	-
F	Stellaria longipes	5	-	2	-	.01	.00
F	Taraxacum officinale	316	*30	96	15	8.56	.78
F	Viola adunca	124	171	39	59	2.32	3.75

Type	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'95	'00	'95	'00	'95	'00
	Total for Annual Forbs	11	0	3	0	0.18	0
	Total for Perennial Forbs	1404	621	467	230	28.44	13.61
	Total for Forbs	1415	621	470	230	28.63	13.61

\* Indicates significant difference at % = 0.10

#### BASIC COVER --

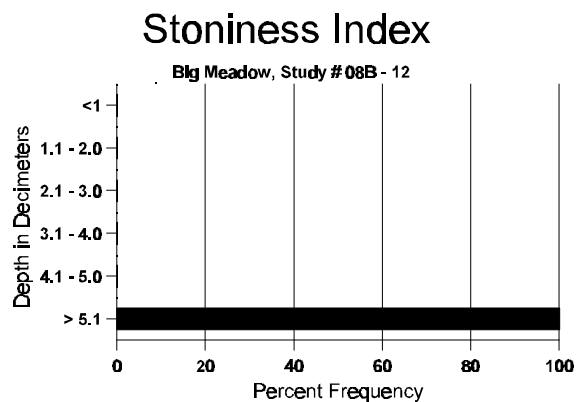
Herd unit 08B, Study no: 12

Cover Type	Nested Frequency		Average Cover %	
	'95	'00	'95	'00
Vegetation	499	492	69.33	70.35
Litter	499	497	76.84	86.00
Cryptogams	83	56	5.28	4.85
Bare Ground	-	8	0	.18

#### SOIL ANALYSIS DATA --

Herd Unit 8B, Study # 12, Study Name: Big Meadow

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
35.43	50.0 (18.11)	7.4	34.0	33.7	32.3	6.1	5.5	256.0	1.2



PELLET GROUP FREQUENCY --

Herd unit 08B, Study no: 12

Type	Quadrat Frequency	
	'95	'00
Elk	-	1
Deer	-	1
Cattle	21	2

Pellet Transect	
Pellet Groups per Acre 00	Days Use per Acre (ha) 00
-	-
-	-
131	11 (27)

### Trend Study 8B-13-00

Study site name: Lower Big Meadow.

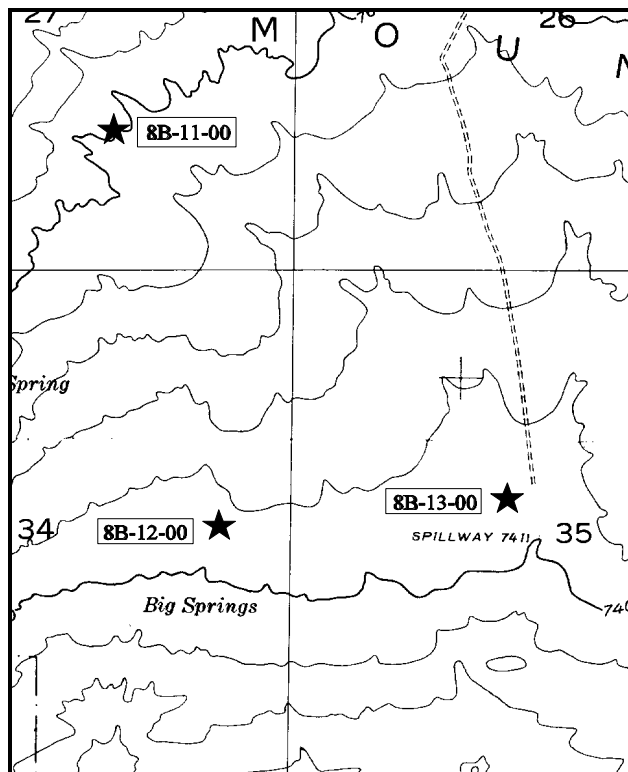
Range type: Wet Meadow.

Compass bearing: frequency baseline 165°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

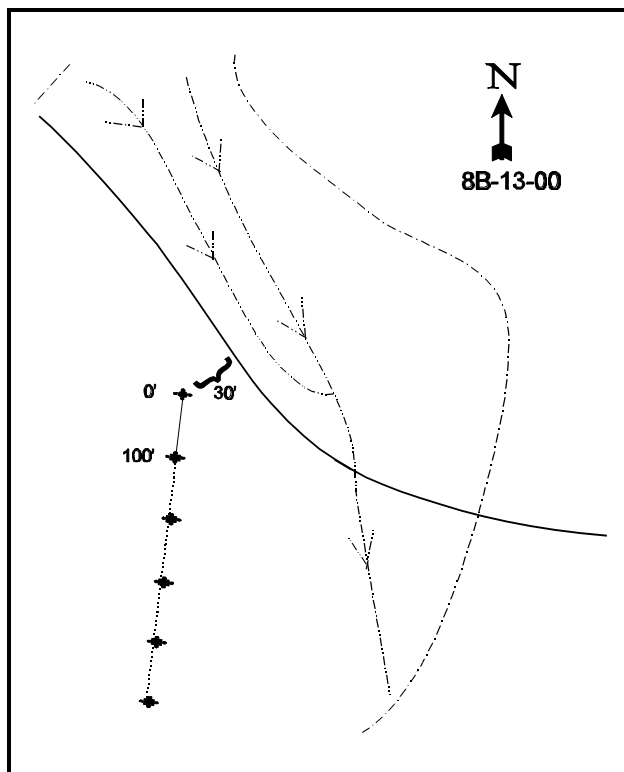
### LOCATION DESCRIPTION

From Dutch John, proceed north towards Antelope Flat on Highway U.S. 191 for approximately 8 miles. Before the Wyoming border, turn east on the Antelope Flat Road towards Goslin Mountain. Go 2.8 miles and turn right towards Goslin Mountain. Bear right and drive 1.3 miles to a gate. Continue 4.5 miles to a fork. Bear right and proceed 0.8 miles passing study 8B-10-00 to a four-way intersection. Bear left and drive 0.6 miles to a post in a meadow 30 feet south of the road. The road is faint as it crosses the large meadow. The 0-foot stake is marked with browse tag #37.



Map Name: Goslin Mtn.

Township 3N, Range 23E, Section 35



Diagrammatic Sketch

UTM 4534895.977 N, 643914.120 E

## DISCUSSION

### Trend Study No. 8B-13 (9-24)

This is a new study site established in 1995 to monitor wildlife and livestock impacts on meadows in the Goslin Mountain area. This study, Lower Big Meadow, was setup on a meadow about one-half of a mile east of study #12. It is a drier site than site #12, but has the same elevation, slope, and aspect. There is water flowing in a small stream to the north-west of the study site. Pellet group quadrat frequency data indicated moderate deer and heavy cattle use in 1995. Pellet group data taken along the study site baseline in 2000, estimate light wildlife use ( <1 deer and 3.4 elk days use/acre or 8 edu/ha). Spring pronghorn antelope pellet groups were fairly abundant and some sage grouse scat was also encountered. Cattle were not on the allotment as of July 6<sup>th</sup> 2000, but use from the 1999 season is estimated at 52 days use/acre.

The soil is deep with an effective rooting depth estimated at nearly 20 inches. There is very little surface rock. Soil texture is a sandy clay loam to loam with a moderately alkaline soil reaction (pH of 8.0). Phosphorus is limited at only 2.4 ppm where values less than 10 ppm can limit normal plant growth and development. Vegetation and litter cover are abundant and prevent any erosion.

Due to the drier nature of this site, species composition is much more diverse than the other meadow sites. Ten to 12 grasses, two sedges, and one rush provided 32% cover in 1995 and 37% cover in 2000. The most common grasses include Canada and Kentucky bluegrass which account for about half of the grass cover. These species are very tolerant of grazing and often occur on disturbed sites. Grasses considered decreasers on this range type include: slender wheatgrass, thickspike wheatgrass, Nebraska sedge, prairie Junegrass and Sandberg bluegrass.

Forbs are more abundant on this site than on site #11 or #12. Combined, they provided a total of 39% cover in 1995 and 34% in 2000. Unfortunately, the most abundant forb is the mat forming rose pussytoes. Other abundant forbs include Pacific aster and dandelion.

### 1995 APPARENT TREND ASSESSMENT

The soil trend appears stable with abundant well dispersed vegetation and litter cover. There is no browse trend because no shrubs occur on the site. The herbaceous understory is very diverse and abundant. However, like the other meadows sampled, less desirable increaser species dominate the understory. Only 18% of the grass cover comes from decreaser species. Fifty-six percent of the forb cover comes from rose pussytoes, a mat forming species, which provides very little forage value. Most of the other forbs are low growing increasers whose dominance indicates over grazing. Overall, 74% of the total vegetative cover is contributed by increaser grasses and forbs.

### 2000 TREND ASSESSMENT

Trend for soil is stable with abundant protective ground cover and little bare ground exposed. There is no erosion occurring on the site. There are no shrubs on the site so there is no browse trend. Trend for the herbaceous understory is down slightly due to a slight decline in the sum of nested frequency for perennial grasses and a substantial decline in the sum of nested frequency of perennial forbs. The grass composition is dominated by the increaser, Kentucky bluegrass, which increased significantly in nested frequency and now accounts for 33% of the grass cover. A Carex and Canada bluegrass are also abundant and combine to produce 44% of the grass cover. Nested frequency of Carex, remained stable while Canada bluegrass declined significantly. Nebraska sedge is found on this site but at a much lower frequency compared to the other meadows. It increased significantly in nested frequency but it only has a quadrat frequency of 25% and a cover value less than 1%. The forb composition is still dominated by rose pussytoes which currently provides 59% of

the forb cover. Field milkvetch, thistle, horsetail, fleabane, and dandelion are also fairly abundant.

# TREND ASSESSMENT

soil - stable (3)

browse - no shrubs on the site (NA)

herbaceous understory - down slightly (2) especially for forbs

## HERBACEOUS TRENDS --

Herd unit 08B, Study no: 13

T y p e	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'95	'00	'95	'00	'95	'00
G	Agropyron dasystachyum	157	*84	46	24	1.55	.75
G	Agropyron trachycaulum	57	78	21	28	.45	1.19
G	Bromus carinatus	-	*35	-	13	-	.55
G	Carex nebraskensis	3	*64	1	21	.03	.80
G	Carex spp.	297	291	84	90	6.59	8.07
G	Hordeum brachyantherum	6	4	3	3	.04	.04
G	Juncus balticus	70	80	24	33	1.12	1.43
G	Koeleria cristata	87	*36	30	15	3.23	.66
G	Muhlenbergia richardsonis	91	49	25	18	2.37	1.97
G	Poa compressa	238	*145	68	42	9.39	8.10
G	Poa fendleriana	-	1	-	1	-	.03
G	Poa pratensis	94	*240	26	61	5.67	12.33
G	Poa secunda	31	12	9	7	.61	.16
G	Sporobolus cryptandrus	41	*-	13	-	.21	-
G	Stipa columbiana	-	*19	-	8	-	.45
G	Stipa lettermani	30	15	9	9	.64	.27
Total for Annual Grasses		0	0	0	0	0	0
Total for Perennial Grasses		1202	1153	359	373	31.94	36.87
Total for Grasses		1202	1153	359	373	31.94	36.87
F	Achillea millefolium	22	36	9	13	.52	.66
F	Antennaria rosea	306	*253	79	71	21.67	19.97
F	Arabis spp.	5	-	2	-	.01	-
F	Astragalus agrestis	115	*135	40	49	1.58	3.70
F	Aster chilensis	177	*70	55	22	3.19	2.07
F	Astragalus spp.	-	*4	-	4	-	.02
F	Cirsium spp.	119	81	47	31	1.04	1.35
F	Convolvulus arvensis	-	1	-	1	-	.03
F	Cymopterus spp.	-	4	-	1	-	.00
F	Descurainia spp. (a)	3	-	1	-	.00	-
F	Draba spp. (a)	15	*-	5	-	.02	-
F	Equisetum spp.	113	141	44	59	.39	.90



Type	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'95	'00	'95	'00	'95	'00
F	Erigeron spp.	62	90	20	31	.41	1.06
F	Eriogonum spp.	3	8	1	2	.03	.06
F	Lithospermum spp.	-	1	-	1	-	.03
F	Potentilla anersina	56	49	21	16	.69	.80
F	Potentilla gracilis	15	14	4	6	.04	.22
F	Ranunculus testiculatus (a)	2	-	1	-	.00	-
F	Sedum lanceolatum	3	-	1	-	.00	-
F	Senecio pauperculus	4	-	1	-	.00	-
F	Sisyrinchium spp.	183	*-	61	-	2.05	-
F	Taraxacum officinale	189	*107	63	38	6.05	2.22
F	Viola spp.	33	18	10	8	.73	.55
F	Zigadenus venenosus	9	*-	3	-	.16	-
Total for Annual Forbs		48	0	16	0	0.46	0
Total for Perennial Forbs		1386	1012	452	353	38.20	33.70
Total for Forbs		1434	1012	468	353	38.67	33.70

\* Indicates significant difference at % = 0.10

#### BASIC COVER --

Herd unit 08B, Study no: 13

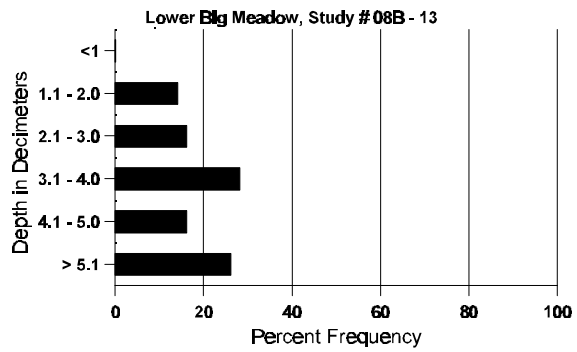
Cover Type	Nested Frequency		Average Cover %	
	'95	'00	'95	'00
Vegetation	499	499	68.32	78.12
Rock	9	-	.01	0
Pavement	-	2	0	.00
Litter	495	478	63.81	72.36
Cryptogams	38	7	.79	.04
Bare Ground	92	80	.52	1.74

#### SOIL ANALYSIS DATA --

Herd Unit 8B, Study # 13, Study Name: Lower Big Meadow

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
19.91	52.4 (18.03)	8.0	49.0	27.7	23.3	3.5	2.4	444.8	1.9

## Stoniness Index



## PELLET GROUP FREQUENCY --

Herd unit 08B, Study no: 13

Type	Quadrat Frequency	
	'95	'00
Rabbit	16	3
Antelope	-	1
Elk	2	-
Deer	12	4
Cattle	40	13
Sage Grouse	-	-

Pellet Transect	
Pellet Groups per Acre 00	Days Use per Acre (ha) 00
174	N/A
87	7 (17)
44	3 (8)
9	1 (2)
618	52 (127)
26	N/A

### Trend Study 8B-14-00

Study site name: Clay Basin Bench.

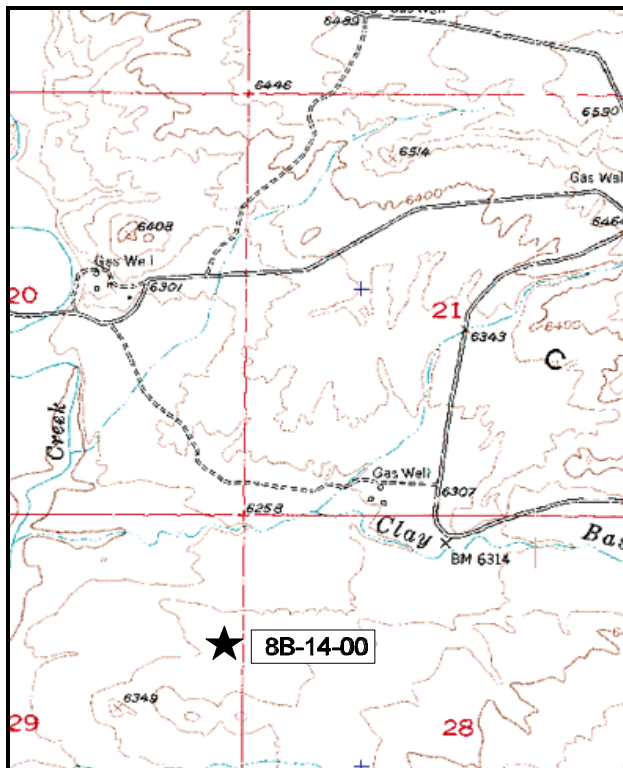
Range type: Big Sagebrush-Grass.

Compass bearing: frequency baseline 107°M.

First frame placement on frequency belts 5 feet. Frequency belt placement; line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

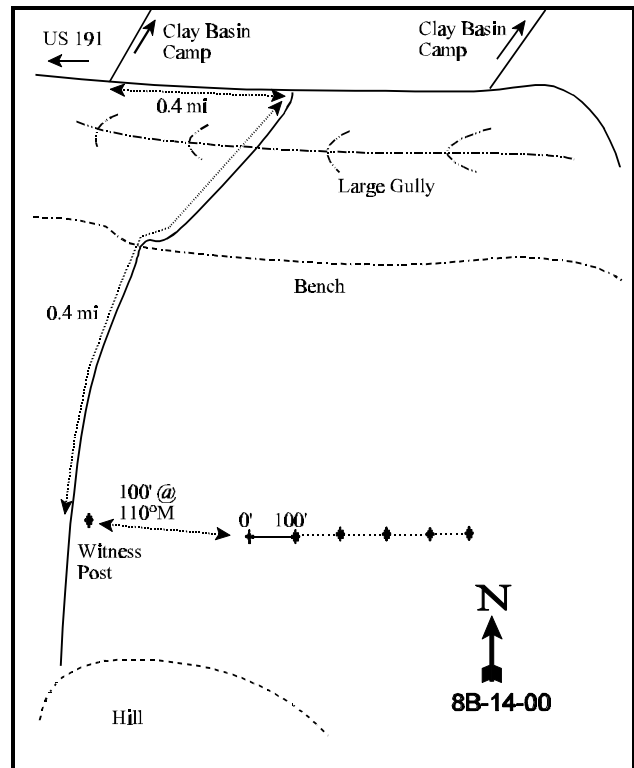
### LOCATION DESCRIPTION

From Dutch John, proceed north towards Antelope Flat on Highway U.S. 191. Continue over the stateline into Wyoming and turn right just after Minnies Gap onto the Clay Basin road. Drive approximately 13 miles towards Clay Basin to the turn off to Clay Basin Camp. Turn right again and proceed 0.4 miles to another intersection. Turn right and go 0.4 miles going through the large gully and onto the bench. The witness post is on the left side of the road. The 0-foot stake is 100 feet away at a bearing of 110°M.



Map Name: Clay Basin

Township 3N, Range 24E, Section 29



Diagrammatic Sketch

UTM 4536844 N, 649503 E

## DISCUSSION

### Trend Study No. 8B-14

The Clay Basin Bench is a new trend study established in 2000 to monitor important big game winter range in Clay Basin. The site is placed on a bench about 1 mile to the south of Clay Basin Camp. It samples a Wyoming big sagebrush type with a gentle slope of 3% at an elevation of 6,300 feet. Aspect is to the west. Cattle graze this area in the summer which were in the area when the site was established. Deer and elk use the area primarily as winter range. Pellet group data taken along the study site baseline in 2000 estimate 56 deer, 5 elk, and 17 cow days use/acre (138 ddu/ha, 12 edu/ha and 42 cdu/ha).

Soil on the site is relatively deep and rock free but compacted with an effective rooting depth estimated at nearly 13 inches. It has a sandy loam texture with a neutral soil reaction (pH of 7.3). Phosphorus is marginal at 6.3 ppm where values less than 10 ppm can limit normal plant growth and development. There are some small active gullies on the site which appear to have originally been cattle trails. Herbaceous vegetation is lacking and percent bare ground is moderately high at 44%. An important stabilizing factor for the soil is the high cryptogamic cover (23%) which combined with vegetation and litter provide marginally sufficient protective ground cover.

The site supports an old stand of Wyoming big sagebrush with a density of 6,500 plants/acre. There is little reproduction in the form of seedlings and young. Seed production is poor this year and not much better last season considering the lack of old seed heads. Leader growth is currently poor averaging about 1 inch. This gives the sagebrush the appearance of being heavily hedged. Some heavy use appears to have taken place in the past, but current use is mostly moderate. Percent decadence is moderately high at 32% and approximately 44%, or 900 plants/acre, of the decadent plants are classified as dying.

Additional browse forage is provided by small numbers of winter fat, stickyleaf low rabbitbrush and slenderbush eriogonum. The most numerous shrub is broom snakeweed, an undesirable increaser. It currently has a density of 12,660 plants/acre which provides 18% of the browse cover. Ninety-three percent of the population was classified as mature. This would indicated a stable population where young plants make up only 2% of the population.

The herbaceous understory is lacking. Perennial grasses, consisting primarily of western wheatgrass, Indian ricegrass and needle-and-thread, produce only about 5% total cover. Forbs are also lacking and produce only 2% cover. Six species were encountered but hoods phlox, a low value, low growing species, dominates the composition by providing 98% of the forb cover.

### 2000 APPARENT TREND ASSESSMENT

The soil condition is poor due to a high percentage of bare ground combined with low cover of litter and vegetation. Even with the slight slope, some active erosion is occurring within the shrub interspaces. Condition of the key browse species, Wyoming big sagebrush, is also poor. The stand is overly mature with no seedlings evident and poor young recruitment at only 2%. Use is mostly moderate and percent decadence is fairly high at 32%. In addition, 44% of the decadent plants sampled are classified as dying and there are currently not enough young plants to replace those that are dead.

HERBACEOUS TRENDS --  
Herd unit 08B, Study no: 14

T y p e	Species	Nested Frequency  '00	Quadrat Frequency  '00	Average Cover %  '00
G	Agropyron smithii	134	50	1.30
G	Bromus tectorum (a)	18	6	.10
G	Oryzopsis hymenoides	71	27	1.12
G	Poa fendleriana	4	1	.00
G	Poa secunda	80	27	.36
G	Sitanion hystrix	14	6	.10
G	Stipa comata	132	51	2.43
Total for Annual Grasses		18	6	0.10
Total for Perennial Grasses		435	162	5.33
Total for Grasses		453	168	5.44
F	Erigeron pumilus	2	2	.01
F	Hymenoxys richardsonii	4	1	.00
F	Penstemon spp.	1	1	.00
F	Phlox hoodii	134	62	1.92
F	Schoenocrambe linifolia	2	1	.00
F	Townsendia incana	4	2	.01
Total for Annual Forbs		0	0	0
Total for Perennial Forbs		147	69	1.95
Total for Forbs		147	69	1.95

BROWSE TRENDS --  
Herd unit 08B, Study no: 14

T y p e	Species	Strip Frequency  '00	Average Cover %  '00
B	Artemisia tridentata wyomingensis	97	15.67
B	Ceratoides lanata	10	.21
B	Chrysothamnus viscidiflorus viscidiflorus	5	.03
B	Eriogonum microthecum	6	.00
B	Gutierrezia sarothrae	82	3.92
B	Opuntia spp.	43	1.75
Total for Browse		243	21.60

BASIC COVER --

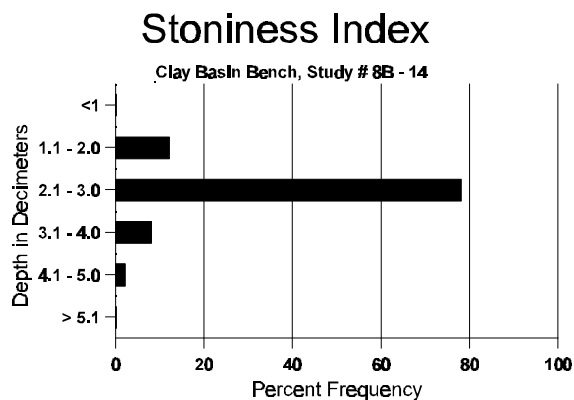
Herd unit 08B, Study no: 14

Cover Type	Nested Frequency	Average Cover %
	'00	'00
Vegetation	389	28.52
Rock	16	.20
Pavement	89	.60
Litter	425	29.68
Cryptogams	277	22.77
Bare Ground	378	43.54

SOIL ANALYSIS DATA --

Herd Unit 8B, Study # 14, Study Name: Clay Basin Bench

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
12.87	56.0 (12.99)	7.3	65.6	17.1	17.3	1.2	6.3	89.6	0.5



PELLET GROUP FREQUENCY --

Herd unit 08B, Study no: 14

Type	Quadrat Frequency	Pellet Transect	
		Pellet Groups per Acre	Days Use per Acre (ha)
	'00	'00	'00
Rabbit	9	70	N/A
Elk	3	70	5 (13)
Deer	47	731	56 (139)
Cattle	4	209	17 (43)

## BROWSE CHARACTERISTICS --

Herd unit 08B, Study no: 14

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Artemisia tridentata wyomingensis																	
Y	00	7	-	-	-	-	-	-	-	-	7	-	-	-	140		7
M	00	87	107	20	1	-	-	-	-	-	215	-	-	-	4300	13 25	215
D	00	35	60	7	1	-	-	-	-	-	58	-	-	45	2060		103
X	00	-	-	-	-	-	-	-	-	-	-	-	-	-	680		34
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'00		51%			08%			14%									
Total Plants/Acre (excluding Dead & Seedlings)														'00	6500	Dec:	32%
Ceratoides lanata																	
M	00	2	7	4	-	-	-	-	-	-	13	-	-	-	260	3 6	13
D	00	-	3	-	-	-	-	-	-	-	1	-	-	2	60		3
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'00		63%			25%			13%									
Total Plants/Acre (excluding Dead & Seedlings)														'00	320	Dec:	19%
Chrysothamnus viscidiflorus viscidiflorus																	
M	00	3	2	-	-	-	-	-	-	-	5	-	-	-	100	8 7	5
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'00		40%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)														'00	100	Dec:	-
Eriogonum microthecum																	
M	00	2	1	4	-	-	-	-	-	-	7	-	-	-	140	4 5	7
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'00		14%			57%			00%									
Total Plants/Acre (excluding Dead & Seedlings)														'00	140	Dec:	-
Gutierrezia sarothrae																	
S	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80		4
Y	00	24	-	-	-	-	-	-	-	-	24	-	-	-	480		24
M	00	589	-	-	-	-	-	-	-	-	589	-	-	-	11780	4 7	589
D	00	20	-	-	-	-	-	-	-	-	15	-	3	2	400		20
X	00	-	-	-	-	-	-	-	-	-	-	-	-	-	60		3
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'00		00%			00%			.78%									
Total Plants/Acre (excluding Dead & Seedlings)														'00	12660	Dec:	3%

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Opuntia spp.																	
Y	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2
M	00	51	-	-	1	-	-	-	-	-	52	-	-	-	1040	3 14	52
D	00	8	-	-	-	-	-	-	-	-	8	-	-	-	160		8
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'00		00%			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)														'00	1240	Dec:	13%



## SUMMARY

### WILDLIFE MANAGEMENT UNIT 8B (9) - NORTH SLOPE, DAGGETT

A total of 13 study sites were read on unit 8B in 2000. Of these, 5 were rereads of sites established in 1982, two were rereads of studies established in 1988, five were rereads of sites established in the Goslin Mountain area in 1995 and the last site was a new trend study established in Clay Basin. One site, Cedar Springs (#1) was dropped. It is totally dominated by pinyon and juniper leaving little browse in the understory. It is no longer considered representative of big game winter range.

Of the 12 trend studies with 2000 trend assessments, 8 sites had stable soil trends. Two had improving trends and 2 trend studies (Bear Top Mtn. and Antelope Flat) had declining trends. Of the 9 trend studies where browse trends were determined, 5 had stable trends while 3 displayed slightly downward trends due to drought conditions (Bear Top Mtn, Bennett Ranch and Death Valley). One site, Bear Top Mountain, has a downward browse trend due to a fire which eliminated most of the shrubs. Herbaceous trends are stable on 4 sites and slightly down on 6 sites (Greendale, Bear Top Mtn, West Goslin, Sagebrush Ridge, Big Meadow and Lower Big Meadow). Two sites have slightly upward herbaceous trends. Drought conditions are obviously effecting these trends. Nested frequency of perennial forbs were down on 8 of the 12 sites. Half of the sites also showed a decline in the sum of nested frequency of perennial grasses but had an increase in cover. Trends for all of the trend study sites on unit 8B are listed below.

#### TREND SUMMARY

	Category	1988	1995	2000
8B-1 Cedar Springs	soil	3	4	NR
	browse	1	1	NR
	herbaceous understory	4	3	NR
8B-2 Goslin Mountain	soil	3	4	4
	browse	3	2	3
	herbaceous understory	5	4	4
8B-3 Bear Top Mountain	soil	4	3	1
	browse	5	3	1
	herbaceous understory	5	2	2
8B-4 Greendale	soil	4	5	5
	browse	5	5	3
	herbaceous understory	5	5	2
8B-5 Bennett Ranch	soil	4	3	3
	browse	5	4	2
	herbaceous understory	4	2	3

(1) = down, (2) = slightly down, (3) = stable, (4) = slightly up, (5) = up  
est = site established, NA = data not available, NR = site not read

	Category	1988	1995	2000
8B-6 Death Valley	soil	5	3	3
	browse	5	3	2
	herbaceous understory	5	3	4
8B-7 Antelope Flat	soil	est	4	2
	browse	est	3	2
	herbaceous understory	est	2	3
8B-8 Phil Pico Mountain	soil	est	4	3
	browse	est	4	3
	herbaceous understory	est	1	3
	Category	1995		2000
8B-9 West Goslin	soil	est		3
	browse	est		3
	herbaceous understory	est		2
8B-10 Sagebrush Ridge	soil	est		3
	browse	est		3
	herbaceous understory	est		2
8B-11 Triangle Meadow	soil	est		3
	browse	est		NA
	herbaceous understory	est		3
8B-12 Big Meadow	soil	est		3
	browse	est		NA
	herbaceous understory	est		2
8B-13 Lower Big Meadow	soil	est		3
	browse	est		NA
	herbaceous understory	est		2
8B-14 Clay Basin Bench	soil			est
	browse			est
	herbaceous understory			est

(1) = down, (2) = slightly down, (3) = stable, (4) = slightly up, (5) = up  
 est = site established, NA = data not available, NR = site not read